ODOT PMIS
USER'S MANUAL

Version 1.2.2
February, 2010

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SECTION 1 - INTRODUCTION

The Infrastructure Information System Laboratory at the University of Toledo has developed a Pavement Database for the Ohio Department of Transportation using the Microsoft Access database format. The ODOTPMIS includes the database and a set of reporting tools to extract the data necessary for pavement performance analysis.

This section of the user's manual includes installation procedures of the ODOTPMIS, an introduction to the menu items, and a brief overview of the basic operations.

1.1 SYSTEM INSTALLATION

Three types of installations may be performed: full, lightweight, and executable file only. The full version includes the entire database, and is necessary for new users. The lightweight version is for users who have the database, but wish to update the program and the required runtime components. During installation, click the "Yes," "Next," and "OK," buttons to install ODOTPMIS successfully. The default directory where PMIS is installed is "C:\Program Files\ODOT Pavement Management Information System." Users can change this installation directory by selecting a different location. Figure 1.1 shows the sequential steps in installing ODOTPMIS for the full and lightweight versions.

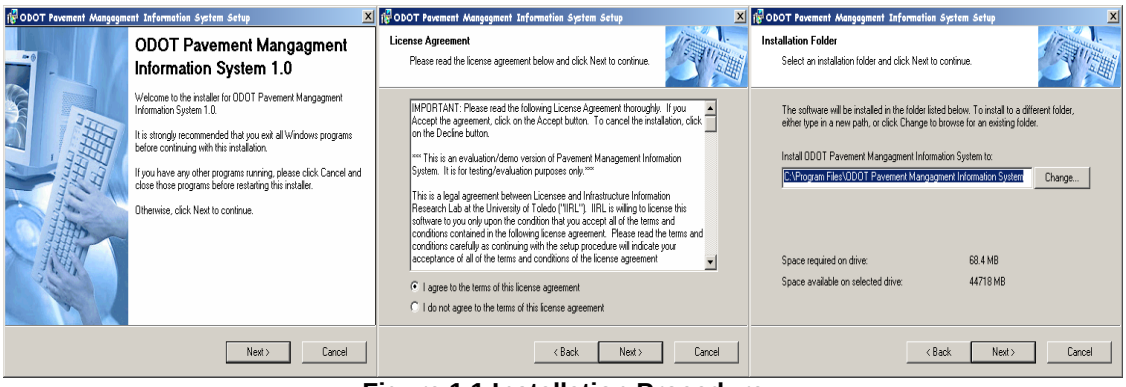


Figure 1.1 Installation Procedure

Users requiring an executable file only installation should download the new executable file from the ODOTPMIS download page and replace the existing executable file (ODOTPMIS.exe) found in the installation directory.

Some program updates may also require updating tables in the database. To replace only these tables in the database:

1. Download the updated tables
2. Open the original database (odot.mdb) in Microsoft Access
3. Delete or rename the tables which will be replaced
4. Under the "File" menu choose "Get External Data" and click "Import"
5. Select the newly downloaded database
6. Select the updated tables
7. Click OK

Newer versions and updates of ODOT PMIS can be downloaded from http://www.eng.utoledo.edu/civil/chou/index.htm under the OdotPMIS Download Page link. Once ODOTPMIS is installed, it attempts to locate the most recently accessed database. If no database can be found, it prompts the user to locate the database manually. To store this path, go to the "File" menu, choose "Preference," check the "Load Last Database" and "Save Database Path" checkboxes, and click the "Apply" button. In the future, ODOTPMIS will use this saved path as the default database path.

1.2 REINSTALLATION

After each reinstallation of the ODOPMIS, the user must locate the path to the database.

1.3 UNINSTALLATION

ODOTPMIS should be uninstalled before a full reinstallation. When uninstalling an older version of the ODOTPMIS, the database is not deleted automatically. If a database with the same name already exists in the same directory where a full version of ODOTPMIS is to be installed, the new database can not be copied into the same directory. The user must manually delete of the older database. This is done to prevent accidental overwriting of the existing database.

1.4 SYSTEM REQUIREMENTS

Recommended software platform requirements for running this package are:

1. Windows 98 / Me / 2000 / XP
2. Microsoft Access 2000

Recommended minimum hardware platform requirements for running this package are:

1. Pentium II 300Mhz CPU
2. 128MB RAM
3. 14" color monitor
4. 2GB free hard disk space
5. Mouse
6. Color printer
7. 4MB video memory
8. CD-ROM drive

1.5 COMPACT DATABASE

Users may find it is necessary to compact the database when its size exceeds 1GB. The database can be compacted by the following process.

1. Choose "Compact and Repair Database" in the "File" menu
2. Open the Access database file "ODOT.MDB" and in the "Tools" menu, choose "Database Utilities," and click on "Compact and Repair Database"

This operation may take 5 – 10 minutes, depending on the size of the database and the specifications of the computer.

1.6 REQUIRED TABLES

For the PMIS utility to operate, several Data and Look-Up tables are required in the database. The tables are:

Table 1.1 PMIS Required Tables

DATA_Apparent Projects	LU_MarkovFamilyDistress	LU_Slope
DATA_FutureProjects	LU_MarkovFamilyPCR	LU_STD Base Class
DATA_InitialCondition	LU_MarkovTree	LU_STD Surface Class
DATA_ODOT	LU_Median Type	LU_Structural Number
DATA_PERF_Analysis	LU_NLFID	LU_Weather
DATA_PERF_BASE	LU_Parameter Range	LU_STD Surface Class
DATA_Project History	LU_PaveType	LU_Structural Number
DATA_Road Inventory	LU_PQIParameters	LU_Weather
LU Pavement Layer	LU_Priority	LU_STD Surface Class
LU_Activity	LU_Project AggType	LU_Structural Number
LU_Activity Modified	LU_RehabCost	LU_Weather
LU_AggType	LU_Repair Limits	LU_Structural Number
LU_BinSummary	LU_Repair Logic	LU_Weather
LU_Centerline Length	LU_Route_Suffix	LU_Color
LU_FHWA Surface Class	LU_Deduct_1998	LU_COST
LU_Functional Class	LU_Distress	LU_County
LU_Inflation	LU_Distress_1998	LU_Deduct
LU_Jurisdiction	LU_LAYER	

PMIS prevents all operations from being performed in the database if any of these tables are missing.

SECTION 2 - BASIC USER INTERFACE ELEMENTS

ODOTPMIS was developed using Microsoft Visual Basic 6.0 to replicate common window-based graphical user interfaces. As such, the PMIS interface utilizes drop down menus located at the top of the screen, a number of buttons located beneath the menus, and an object browser to list queries and tables stored in the pavement management database. The following is a screenshot of ODOTPMIS.

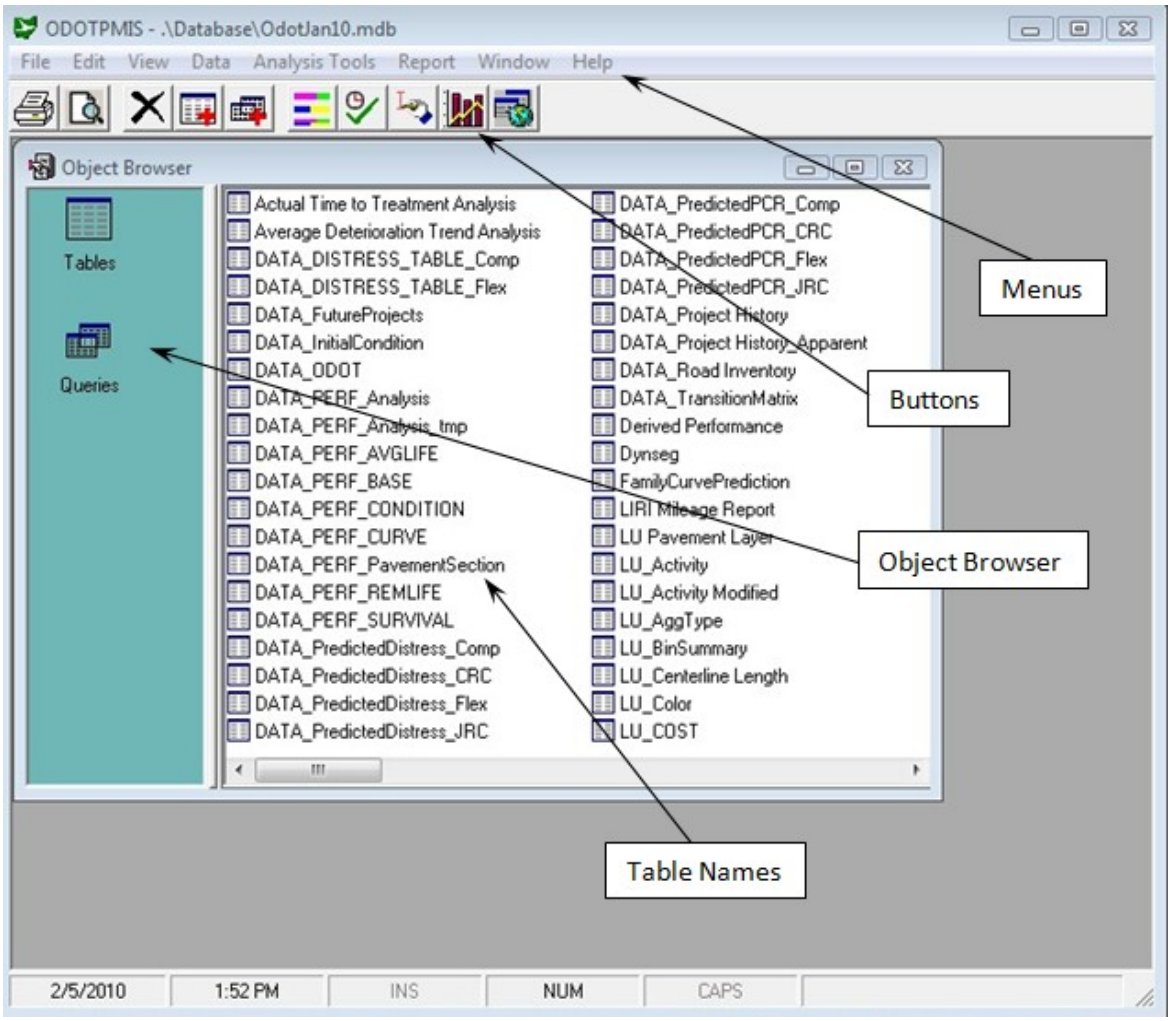


Figure 2.1 ODOTPMIS User Interface

SECTION 3 - FILE MENU

The following figure shows the “File” menu options.

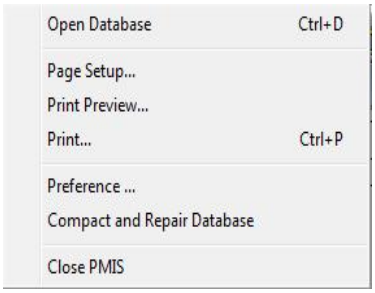


Figure 3.1 ODOTPMIS File Menu

3.1 OPEN DATABASE

This command is used to open the desired database for use within ODOTPMIS. The dialog box shown in Figure 3.2 is shown when this option is clicked.

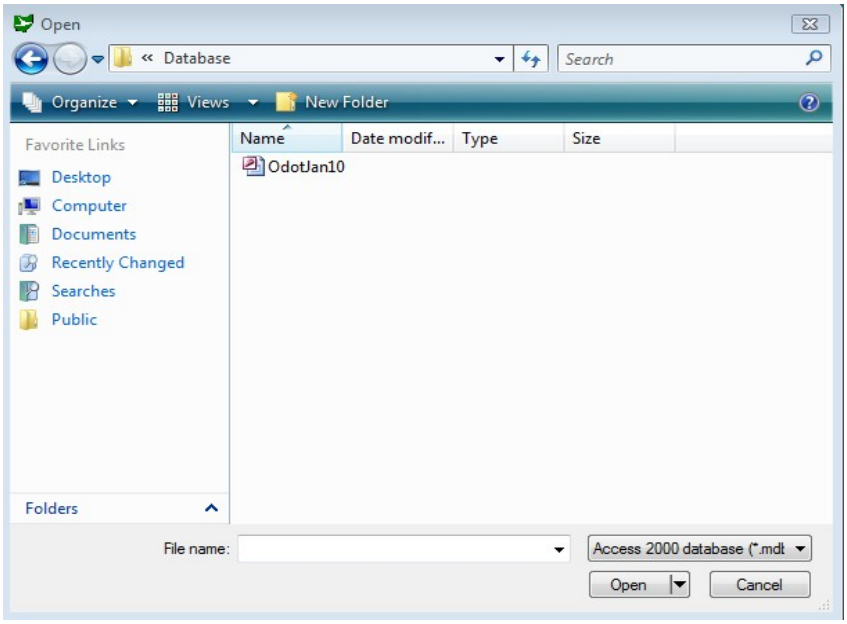


Figure 3.2 Open Database Dialog Box

Choose the database file by selecting the directory from the drop down selector labeled “Look in.” Select the file and click “Open.”

3.2 PAGE SETUP

The “Page Setup” command is a common Microsoft control used for selecting the printer, controlling print and paper properties, orienting the layout, and setting margins. In the “File” menu, click “Page Setup.” The following dialog box will appear.

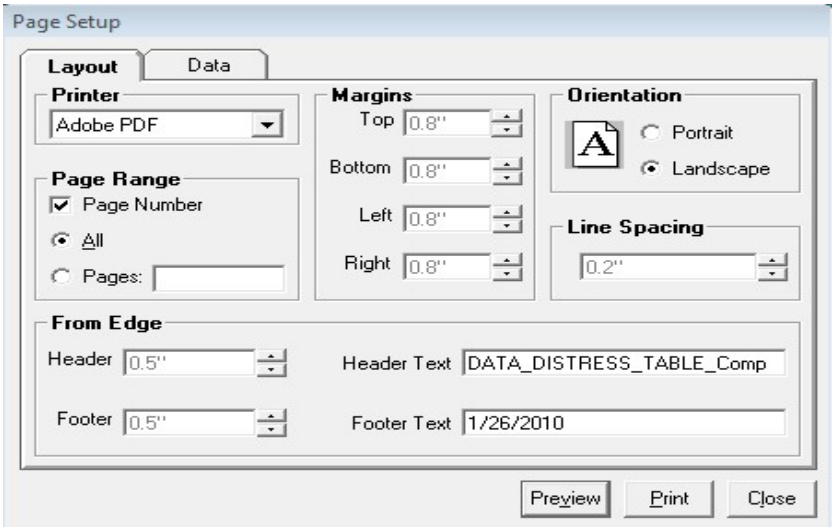


Figure 3.3 Page Setup Dialog Box

3.3 PRINT PREVIEW

This command is a common Microsoft function used for viewing a table, report, or chart. All the tools in ODOTPMIS have a "Print Preview" option. Check this option to get a preview of the output obtained from the tools (reports, tables, or charts). Figure 3.4 shows the preview of the lookup table "LU_Activity."

To preview the same table, use the following process:

1. In the object browser, select "LU_Activity"
2. In the "File" menu, select "Print Preview"
3. The preview shown in Figure 3.4 will be generated

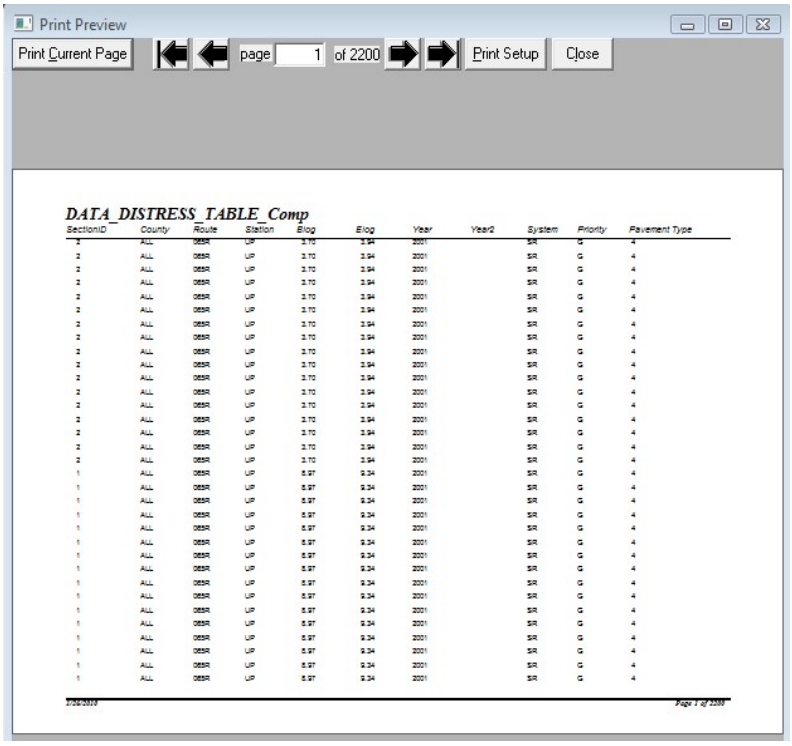
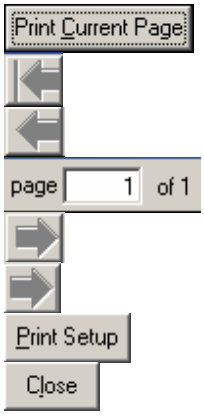


Figure 3.4 Print Preview of [LU_Actvity]

This preview page has the following options:



Print the current page only

Go to first page

Go to previous page

Current page number

Go to next page

Go to last page

Open the print setup window

Close the print preview

The “Print Setup” window provides options to customize the document for printing. This allows users to change the layout, column widths, column orders, and other organizational aspects. Figure 3.5 shows the “Print Setup” window.

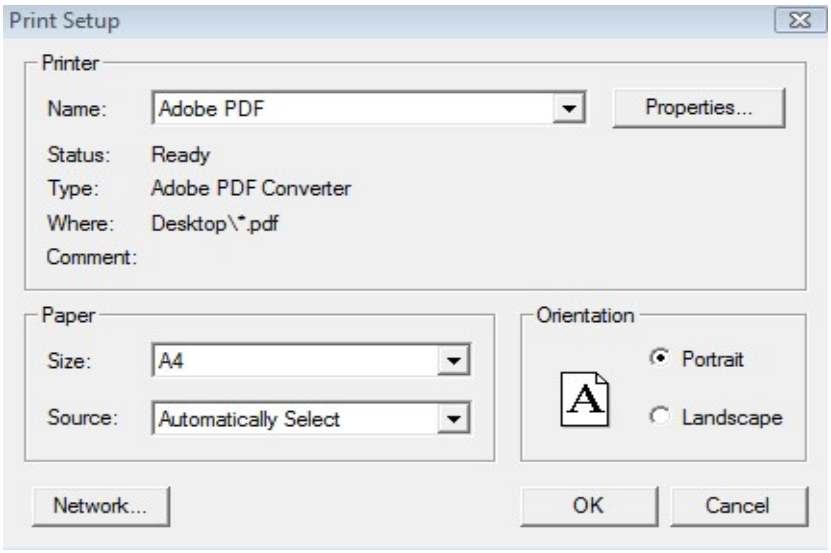


Figure 3.5 Print Setup Dialog Box – Layout Tab

The "Print Setup" dialog has two tabs: layout and data. The layout tab, shown above in Figure 3.5, provides options to select the printer, printed page range, orientation, layout, line spacing, and header and footer spacing and text.

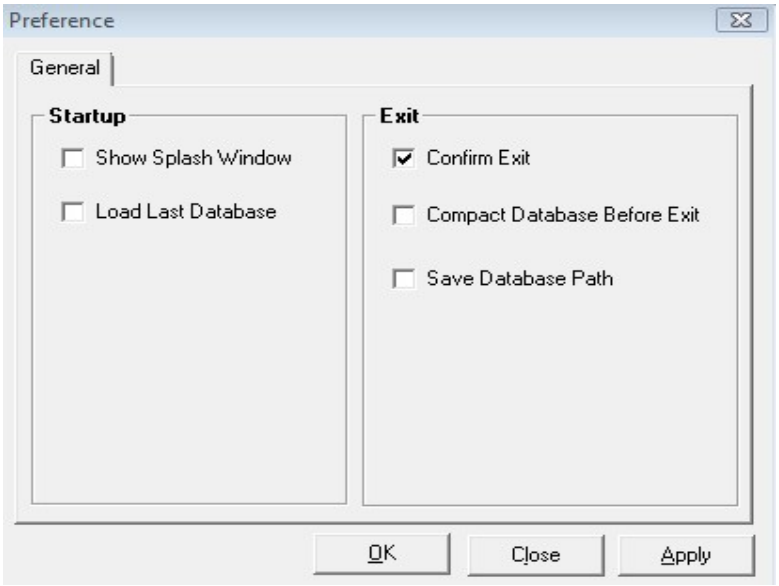


Figure 3.6 Print Setup Dialog Box – Data Tab

The data tab, shown above in Figure 3.6, lists the fields that will be printed, along with options to change their appearance.

Users can click on any of the first three columns to change the font, style, and size of the text as shown below in Figure 3.7. The following dialog box will be displayed when one of the options is clicked. Users then select the required font, style, and size in the dialog and click "OK." The fields will reflect the new changes.

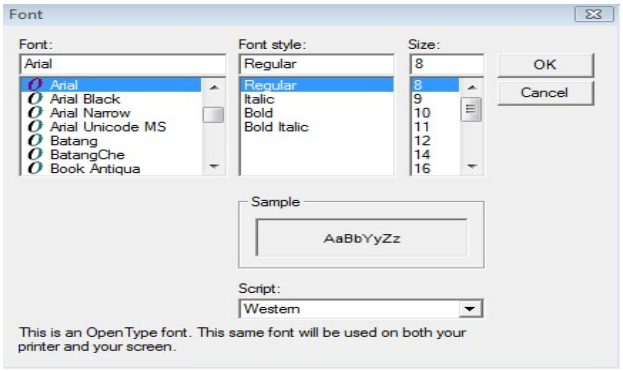


Figure 3.7 Font Dialog Box

The main "Print Setup" window has additional options for users to customize the data printout. These options are explained below.

1. **Color**: Changes the text color of the data in selected column
2. **Width**: Columns are adjusted to a default width based on their length in the printout. The "Width" field allows users to enter a custom width length in inches
3. **Skip**: Select a column to hide or show in the printout
4. **Char**: Shows the character length of the field
5.  The buttons on the right of the screen allow users to change the order of the fields that will be on the printout
6. **Preview**: Displays a mockup with the changes applied
7. **Print**: Print and close the "Print Setup" window
8. **Close**: Closes the "Print Setup" window without making any changes

3.4 PRINT

This command under the "File" menu is used for printing a table, chart or a grid.

3.5 PREFERENCE

This option is used to set the default options for ODOTPMIS as shown in Figure 3.8. The presence or absence of a checkmark next to an option indicates its state.

Startup options appear when the application is opened. These are explained below.

1. **Show Splash Window**: Displays a window showing application information when ODOTPMIS is opened.
2. **Load Last Database**: Loads the last database opened on ODOTPMIS startup.

Exit options appear when the application is closed. These are explained below.

1. **Confirm Exit**: Displays a warning confirmation window when users attempt to close the application.
2. **Compact Database Before Exit**: Compacts the database before each close.
3. **Save Database Path**: Saves the current database path to allow users to open the same database without reentering the location the next time it is opened.

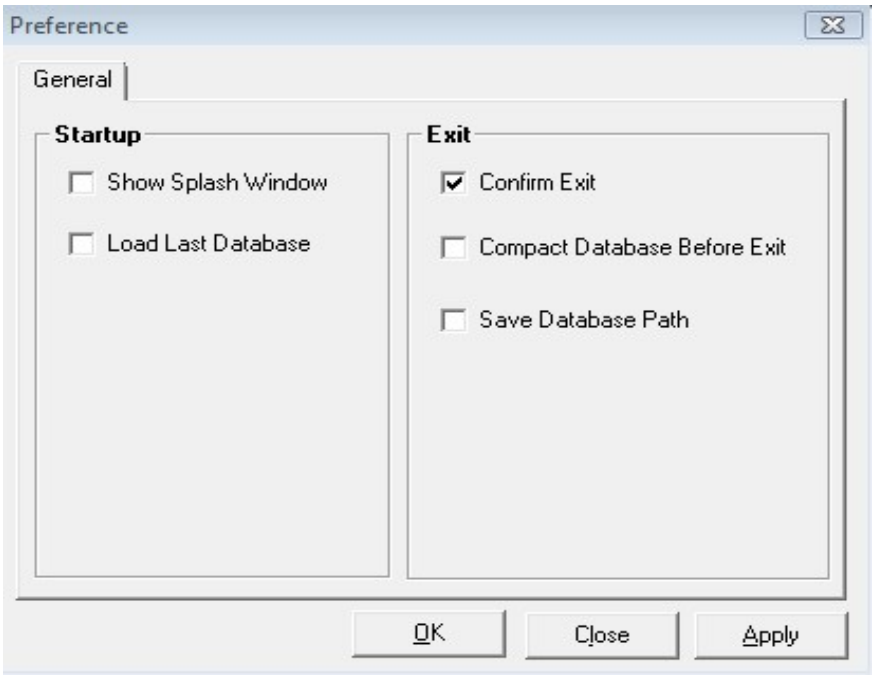


Figure 3.8 Preference Setup Interface

3.6 COMPACT AND REPAIR DATABASE

The "Compact and Repair Database" command activates a utility that compresses the database, which increases the analysis speed. This command should be performed regularly to ensure optimal performance. ***WARNING: If the database is allowed to reach its maximum size of two gigabytes, none of the PMIS functions will function***. Furthermore, at two gigabytes, the database cannot be used for executing queries. To prevent or alleviate these problems, compact the database regularly.

3.7 CLOSE PMIS

This option is used to exit from the PMIS application.

SECTION 4 - EDIT MENU

The "Edit" menu contains commands for changing, creating, and deleting tables and queries. This menu will affect whichever data type is displayed in the object browser, either a query or table. The commands included on this menu are "Open," "Design," "Delete," and "New." The following figure shows the drop down menu

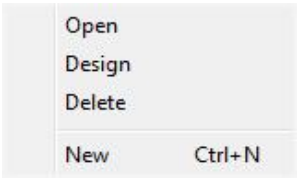


Figure 4.1 ODOTPMIS Edit Menu

4.1 OPEN

This option opens a table for editing values. To open a table, highlight a table in the object browser and select "Open" in the edit menu.

4.2 DESIGN

The "Design" command allows for the creation and deletion of columns in tables or modification of the SQL in queries. To modify a table or query, select it in the object browser and in the "Edit" menu, choose "Design." The dialog box shown below in Figure 4.2 will appear.

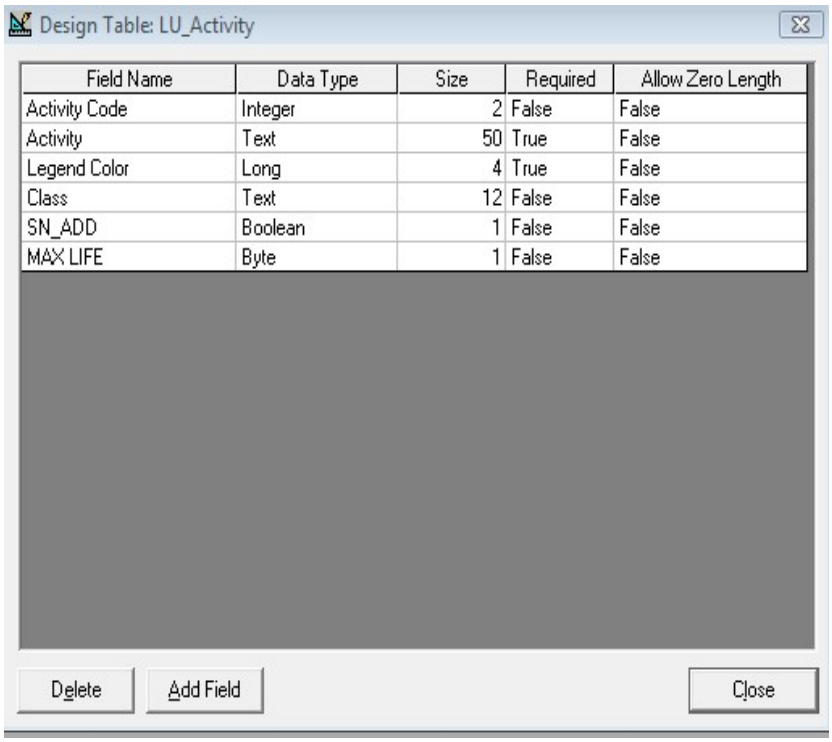


Figure 4.2 ODOTPMIS Design Menu

To add, click on the "Add Field" radio button in the lower left corner of the window. To delete, select the field and click the "Delete" button in the lower left corner of the window. To modify, select the field. ODOTPMIS will allow users to make the changes directly in the table.

4.3 DELETE

This command deletes the selected table or query from the database.

4.4 NEW

Creating a New Table:

1. Click "New" in the "Edit" menu
2. The dialog box as shown in Figure 2.12 will appear
3. Enter the desired table name in the dialog and click "Create"
4. This will display the "Design Table Dialog" shown in Figure 2.13. Users can add or delete fields, and set field properties like the field name, data type, and size, as well as toggle whether this field is required and whether a zero length is allowed

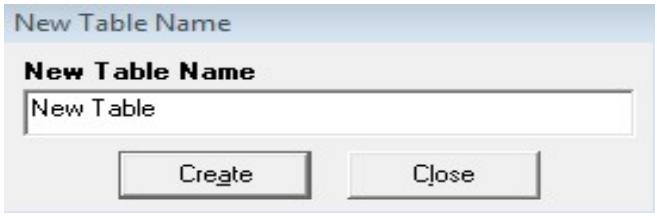


Figure 4.3 New Table Name Input Interface

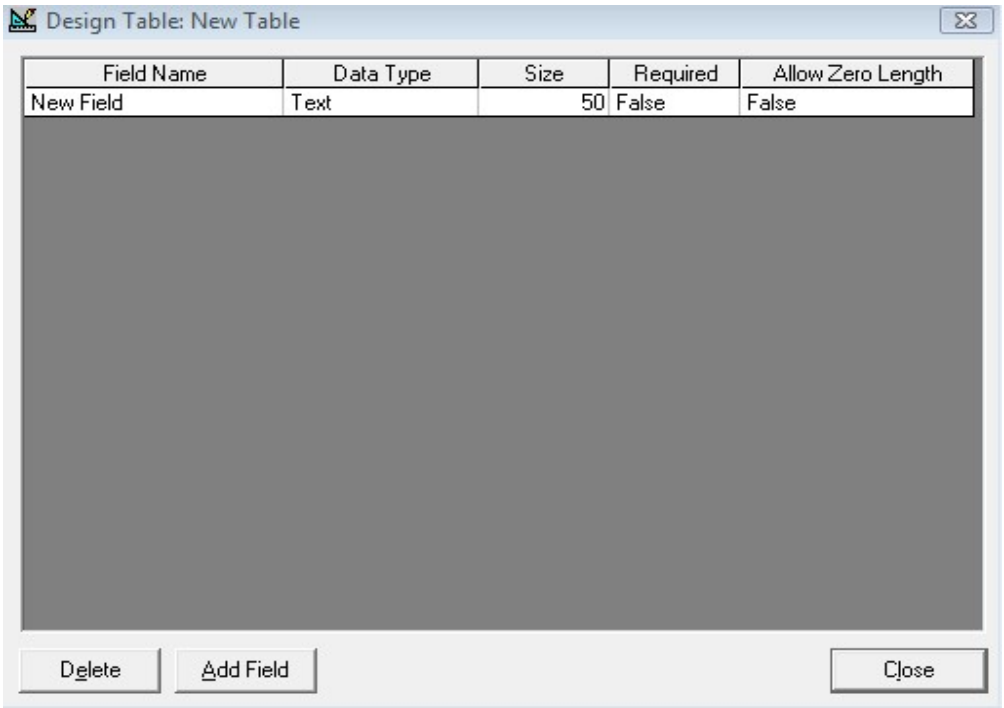


Figure 4.4 New Table Name Input Interface

Creating a New Query:

1. Select “Queries” in the sidebar of the object browser
2. Click “New” in the “Edit” menu
3. A dialog box as shown in Figure 2.14 will be displayed
4. Enter a name for the query in the “Query Name” text box
5. Type in a query. The typed query must follow the standard syntax as Access SQL
6. Close the dialog to auto-save

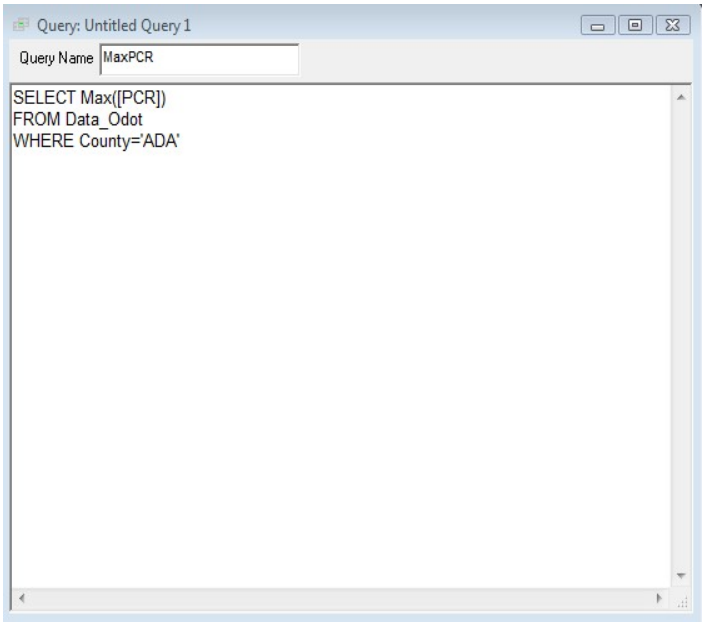


Figure 4.5 Query Edit Interface

Modifying an Existing Query

1. Select a query in the object browser
2. In the “Edit” menu, click “Design”
3. A similar dialog box as above will appear displaying the selected query
4. Change the query and close the dialog box to auto-save

SECTION 5 - VIEW MENU

The "View" menu contains commands for ensuring that the toolbars and the object browser are updated and visible. The commands include "Show Toolbar," "Show Object Browser," and "Refresh Object Browser."

Figure 5.1 ODOTPMIS View Menu

5.1 SHOW OBJECT BROWSER (SHORTCUT KEY: CTRL+O)

This option is used to show the object browser. The presence of a check mark next to its name in the "View" menu indicates that the object browser will be displayed in the main ODOTPMIS window.

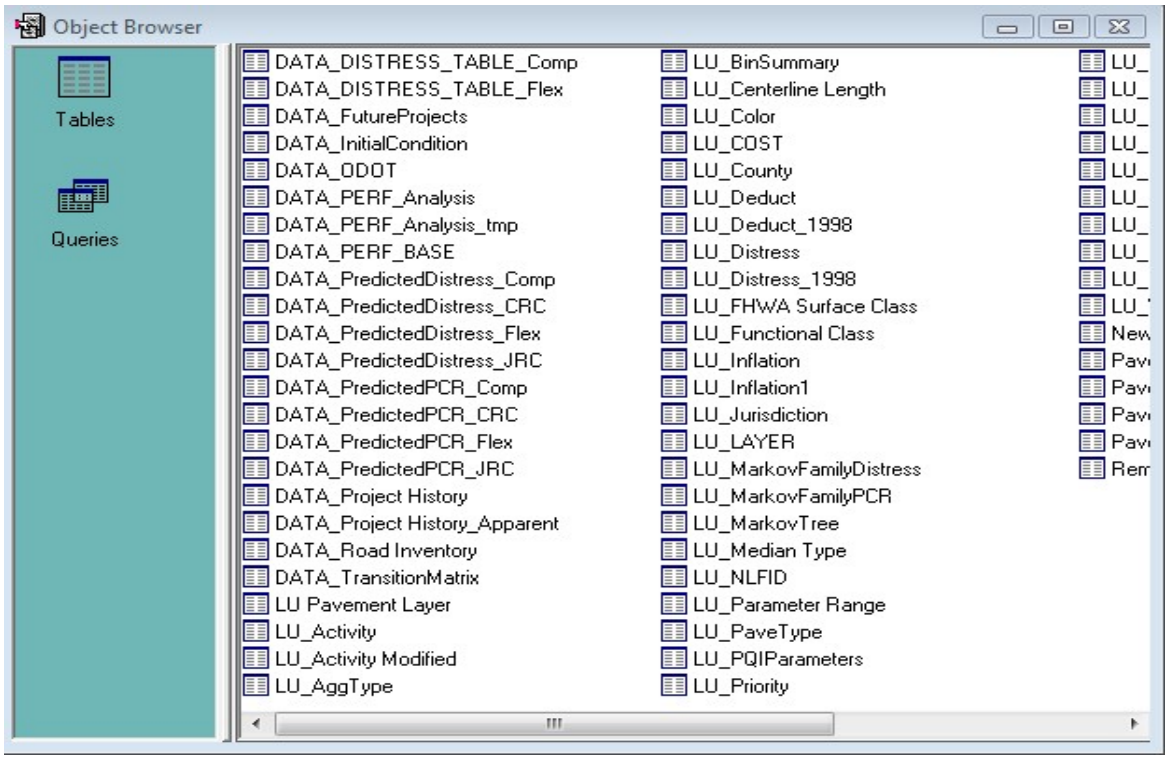


Figure 5.2 Show Object Browser

The object browser displays a list of the tables and queries in the current database. The object browser contains two filters:

1. **Tables**: Displays a list of all the tables in the database
2. **Queries**: Displays a list of all the queries in the database

5.2 SHOW TOOLBAR (SHORTCUT KEY: CTRL+T)

This option is used to show or hide the toolbar, which contains the following buttons:

 Print

 Print Preview

 Delete Table or Query

 New

 New

 Sort the records of a table in ascending order for selected column (this button appears only when a table is opened)

 Sorts the records of a table in descending order for selected column (this button appears only when a table is opened)

 Linear Superposition*

 Project History Plot*

 Project History

 Statistical Report*

 Map View of a Table*

**See Part IV: Advanced Features*

5.3 REFRESH OBJECT BROWSER (SHORTCUT KEY: F5)

This option is used to refresh the object browser to display updated information.

SECTION 6 - DATA MENU

The "Data" menu contains functions that add or modify tables needed for the successful operation of PMIS.

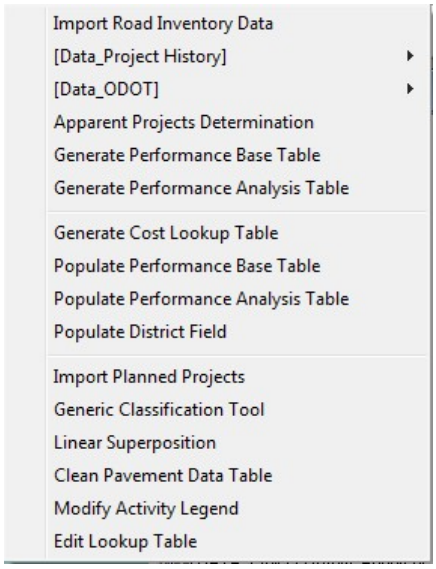


Figure 6.1 ODOTPMIS Data Menu

6.1 IMPORT ROAD INVENTORY DATA

This tool allows users to update the road inventory table with new data from text files. Road inventory tables include the following information: road geometry, classification, priority, system, and traffic volume. These tables should be updated every year. The name of this table in ODOTPMIS is *DATA_Road Inventory*.

Table to Apply: [DATA_Road Inventory]
Data file type: Fixed column position text file
Data format:
[*Value 1*][*Value 2*] [*Value 3*] [*Value 4*] … [*Value 55*]
[*Value 1*][*Value 2*] [*Value 3*] [*Value 4*] … [*Value 55*]
[*Value 1*][*Value 2*] [*Value 3*] [*Value 4*] … [*Value 55*]
…

To import data, click on the "Data" menu and select "Import Road Inventory Data." The window shown in Figure 6.2 will appear. Select the drive on which the file is stored using the "Drives" drop down menu, or use the "Network" button to select a network drive. Navigate to the directory of the data files using the "Folders" sub-window and use the "File name" sub-window to select the correct text file. Click "OK."

Users may or may not check the "Read only" box to prevent changes to the data, depending on their uses for this specific table.

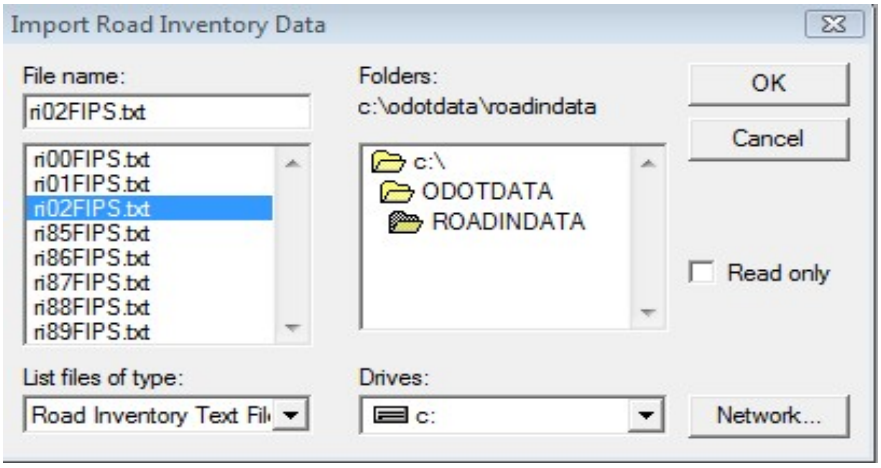


Figure 6.2 Import Road Inventory Data

Note: Field values must be in the order specified in following table.

Table 6.1 Field Order, Name and Data Format

Order	Field Name	Data Type	Column Position	Example
1	Jurisdiction	Text	1	S
2	County	Text	2-4	ADA
3	Route	Text	5-7	032
4	Route Suffix	Text	8	R
5	Blog	Text	10-13	0000
6	Log Point Suffix	Text	14	Space
7	Road Identification	Text	15	D
8	Data Type	Integer	16-19	PSTB
9	Data Status	Text	20	E
10	Transaction	Number	21	A
11	Inventory Perpetuation Date	Number	22-25	0100
12	FIPS Code	Number	27-29	Space
13	Mile Class	Byte	31	1
14	Section Length	Text	32-35	0035
15	System Class	Text	36	M
16	Standard Surface Classification	Text	38	G
17	Standard Base Classification	Text	39	L
18	Summary FHWA Surface Type	Text	40-41	I
19	Surface Width	Number	42-43	48
20	Summary Roadway Width	Number	44-45	64
21	Population (100's)	Number	46-49	0
22	Left Side Standard Surface Class	Text	50	G
23	Left Side Standard Base Class	Text	51	L
24	Left Side FHWA Surface Type	Text	52-53	I
25	Left Side Surface Width	Number	54-55	24
26	Median Width	Number	56-57	60
27	Right Side Standard Surface Class	Text	58	G
28	Right Side Standard Base Class	Text	59	L
29	Right Side FHWA Surface Type	Text	60-61	I
30	Right Side Surface Width	Number	62-63	24
31	Year in Inventory	Number	64-65	96
32	Federal-Aid Primary (FAP)	Number	66-69	0009

	Number			
33	National Highway System (NHS)	Text	70	S
34	System	Text	71	SR
35	Highway Performance Monitoring System	Text	72	
36	Maintenance Route Type	Number	73-74	20
37	Population (over/Under 5000)	Number	75	
38	Municipality Name	Text	76-91	
39	Divided Highway Indicator	Text	92	*
40	Access Control	Text	93	L
41	Lanes	Number	94	4
42	District	Number	95-96	09
43	Number of Lanes (two character)	Number	97-98	
44	Station Equation Sort Field	Number	99	1
45	Elog	Number	100-103	0035
46	Priority	Text	104	P
47	Area Code	Number	105-107	000
48	Functional Class	Number	108-109	02
49	Car ADT	Number	111-116	4790
50	Truck ADT	Number	117-122	1370
51	Total ADT	Number	123-128	6160
52	ADT - Year of counts	Number	129-130	92
53	ESALx1000	Number	133-137	230
54	Year	Number	138-141	2000
55	NLFID	Text	142-155	SADASR00032**C

A typical road inventory text file will exhibit the data structure shown in Figure 6.3.

```
SUNI033R 0000 DPSTBEA0106 000 10029M GLI 4896    GLI 2420GLI 24970011N2 20                *F4060410029P00002 01
SUNI033R 0029 DPSTBEA0106 000 10036M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410065P00002 01
SUNI033R 0065 DPSTBEA0106 000 10205M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410270P00002 01
SUNI033R 0270 DPSTBEA0106 000 10515M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410785P00002 02
SUNI033R 0785 DPSTBEA0106 000 10049M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410834P00002 02
SUNI033R 0834 DPSTBEA0106 000 10001M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410835P00002 02
SUNI033R 0835 DPSTBEA0106 000 10010M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410845P00002 02
SUNI033R 0845 DPSTBEA0106 000 10013M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410858P74712 02
SUNI033R 0858 DPSTBEA0106 000 10016M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060410874P74712 02
SUNI033R 0874 DPSTBEA0106 000 10009M GPI 4878    GPI 2444GPI 24960011N2*20                *F4060410883P74712 02
SUNI033R 0883 DPSTBEA0106 000 20041M GPI 48780159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060410924P74712 03
SUNI033R 0924 DPSTBEA0106 000 10061M GPI 4878    GPI 2444GPI 24960011N2*20                *F4060410985P74712 03
SUNI033R 0985 DPSTBEA0106 000 20051M GPI 48760159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411036P74712 03
SUNI033R 1036 DPSTBEA0106 000 20120M GPI 48760159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411156P74712 03
SUNI033R 1156 DPSTBEA0106 000 20034M GPI 48760159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411190P74712 03
SUNI033R 1190 DPSTBEA0106 000 20029M GPI 48760159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411219P74712 03
SUNI033R 1219 DPSTBEA0106 000 20018M GPI 48760159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411237P74712 03
SUNI033R 1237 DPSTBEA0106 000 20022M GPI 48800159GPI 2444GPI 24960011N2*20OMARYSVILLE     *F4060411259P74712 03
SUNI033R 1259 DPSTBEA0106 000 20026M GLI 48800159GLI 2444GLI 24990011N2*20OMARYSVILLE     *F4060411285P74712 03
SUNI033R 1285 DPSTBEA0106 000 20025M GLI 48720159GLI 2450GLI 24960011N2 20OMARYSVILLE     *F4060411310P74712 03
SUNI033R 1310 DPSTBEA0106 000 10022M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060411332P74712 03
SUNI033R 1332 DPSTBEA0106 000 10097M GLI 4872    GLI 2450GLI 24960011N2 20                *F4060411429P74712 03
SUNI033R 1429 DPSTBEA0106 000 20070M GLI 48720159GLI 2450GLI 24980011N2 20OMARYSVILLE     *F4060411499P74712 03
SUNI033R 1499 DPSTBEA0106 000 10084M GLI 4872    GLI 2450GLI 24980011N2 20                *F4060411583P74712 03
SUNI033R 1583 DPSTBEA0106 000 10454M GLI 4872    GLI 2450GLI 24030011N2*20                *F4060412037P00002 03
```

Figure 6.3 Snapshot of Road Inventory File

6.2 DATA_PROJECT HISTORY

The [Data_Project History] sub-menu contains tools that update the *Data_Project History* table. The tools available under this menu are *Project History Menu, Populate Structural Number Added, Populate Modified Activity Code, and Calculate Thickness Added.*

6.2.1 Project History Entry

Projects performed on pavement each year are recorded in the *DATA_Project History* table. This table can be updated by selecting "Project History Entry" under the "Project History Menu." This will launch the data entry form shown in Figure 6.4 for users to view, edit, and input the data to be displayed in the *DATA_Project History* table.

Table to Apply: [DATA_Project History]
Data type and format: User input

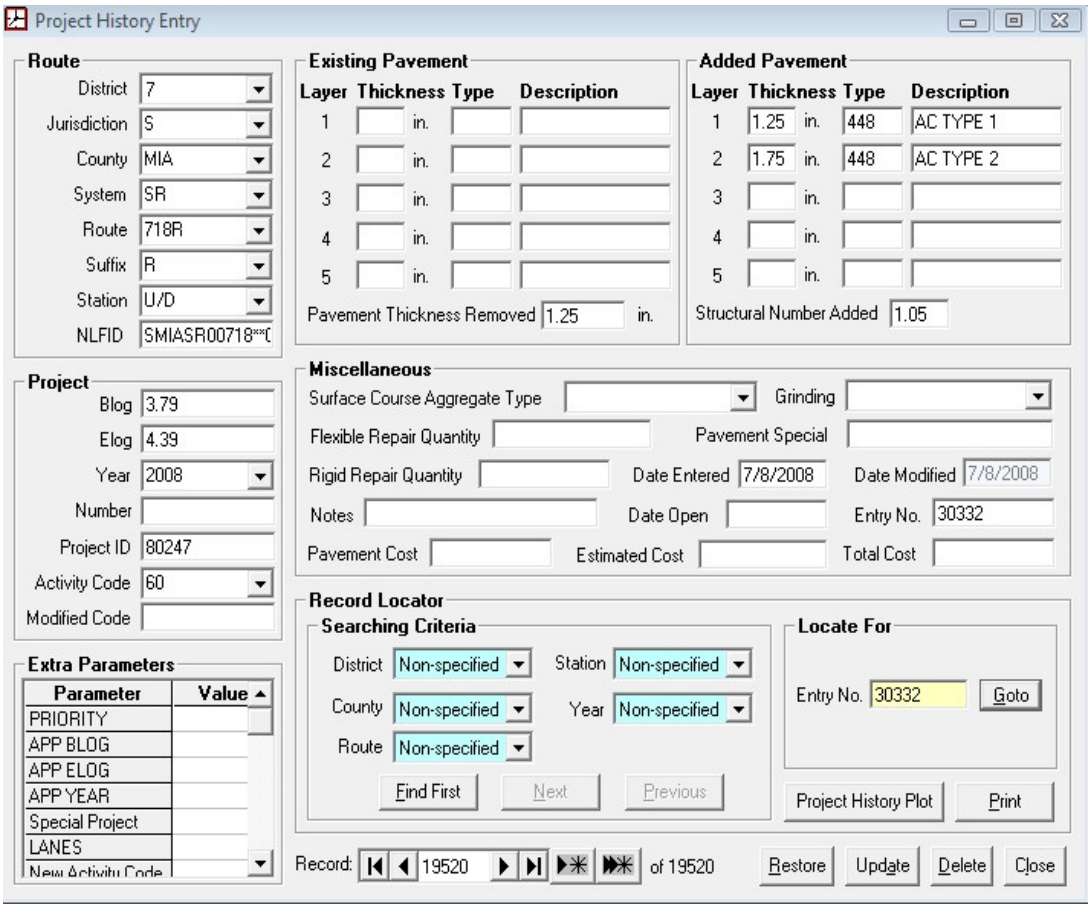


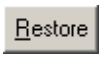
Figure 6.4 Project History Entry

There are several options provided on the form for browsing, updating and deleting the records. These are as follows:

 Record navigator

 Add a new blank record

 Copy the current record as a new record

 Restore the current record to its original status

 Update current record and make all changes permanent

 Delete current record. The deleted record cannot be restored.

 Close this tool

Comments:

Until the user leaves the input window,  button can be used to restore the current record to its original status and discard any changes. To permanently update the current record,  button must be clicked. To delete the current record, user can use  button. If a record is deleted, it cannot be restored. You can also locate a record by using the "Record Locator" search tool or the "Entry No." box. Any field not having a specific input box will appear in the "Extra Parameters" list. This means the user can input more fields into table [DATA_Project History]. However, the total number of fields in any table is limited to 256.

6.2.2 Populate Structural Number Added

This tool calculates the "Structural Number" of every entry in the *DATA_Project History* table and adds a new field [SN_Add]. The "Structural Number" is calculated according to the definitions in the table [LU_Structural Number].

6.2.3 Populate Modified Activity Code

This tool determines the "Modified Activity Code" for every entry in the *DATA_Project History* table. "Modified Activity Code" differs from "Activity Code" only in that it distinguishes between "Thin" and "Thick" overlays. If the thickness added of 50 or 60 is less than or equal to 2 inches, its "Modified Activity Code" becomes 41 or 42 correspondingly. This tool facilitates the analysis of thin and thick overlays.

6.2.4 Calculate Thickness Added

This tool calculates the "Total Thickness Added" and stores the result *DATA_Project History* table. A pavement can contain different layers. The thickness of each added layer is stored separately in the table. Sometimes it is useful to know the total thickness added to a pavement in a project. This tool calculates the total thickness added and stores the result in *DATA_Project History* table.

6.3 DATA_ODOT

The Data_ODOT sub-menu contains tools that update the *Data_ODOT* table. The tools available under this menu are *Import Pavement Condition Data, Calculate PCR and Deducts, and Calculate PQI.*

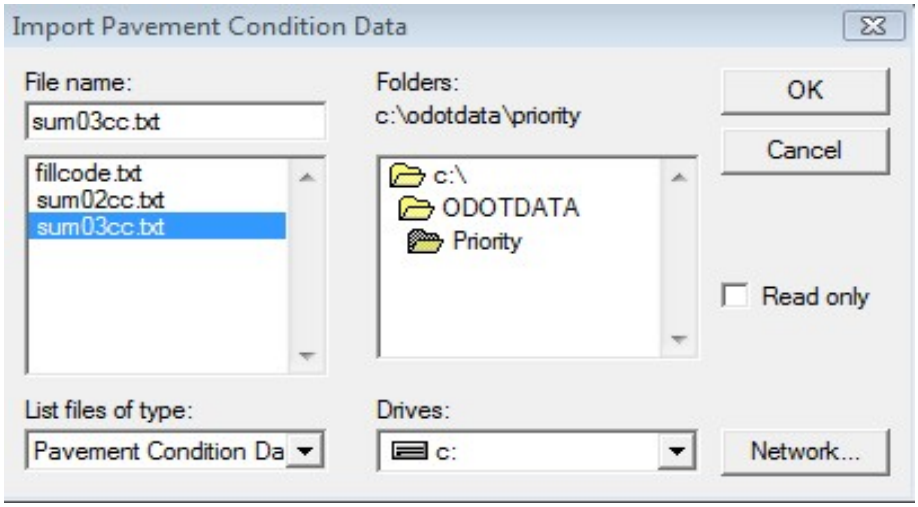
6.3.1 Import Pavement Condition Data

This tool allows for updating of the *DATA_ODOT* table. In ODOTPMIS, pavement condition data such as PCR, RN, IRI, PSI, etc. are stored in *DATA_ODOT* table. This table also stores all road classification and distress data. This pavement condition data should be updated annually. To import condition data correctly, the source data file must have the required format.

Table to Apply: [DATA_ODOT]
Data file type: Coma delimited text file
Data format:
Value 1,Value 2,Value 3,Value 4,…
Value 1,Value 2,Value 3,Value 4, …
Value 1,Value 2,Value 3,Value 4,…

To import data, click on the "Data" menu and select "Import Pavement Condition Data." The window shown in Figure 6.5 will appear. Select the drive on which the file is stored using the "Drives" drop down menu, or use the "Network" button to select a network drive. Navigate to the directory of the data files using the "Folders" sub-window and use the "File name" sub-window to select the correct text file. Click "OK."

Users may or may not check the "Read only" box to prevent changes to the data, depending on their uses for this specific table.



6.5 Import Pavement Condition Data

Note: Field values must be in the order specified in Table 6.2.

Table 6.2 Field Order, Name and Data Format

Order	Field Name	Data Type	Example
1	NLFID	Text	SDARUS00036**C
2	District	Byte	7
3	County	Text	DAR
4	Route	Text	036R
5	Station	Text	UP
6	Blog	Single	13.41
7	Elog	Single	13.43
8	Year	Integer	1996
9	Priority	Text	G
10	PCR	Byte	97
11	TDC	Single	3
12	STRD	Single	0
13	Pavement Type	Byte	3
14	Project Number	Text	22871
15-39	Code 1 – Code 25	Text	Code 1 = LE
40	Rater 1	Text	RS
41	Rater 2	Text	
42	Divided - RI	Text	
43	Divided - PCR	Text	U
44	Mile Class	Text	1
45	Urban Area Code	Integer	735
46	Functional Class	Integer	14
47	NHS Field	Text	
48	National Highway System (NHS)	Text	
49	Route Type	Byte	2
50	MPC	Byte	6
51	Access Control	Text	N
52	Lanes	Byte	2
53	Surface Type	Text	I
54	Surface Width	Byte	24
55	Sum Road Width	Byte	44
56	Truck ADT	Long Integer	760
57	Total ADT	Long Integer	6210
58	ESALX1000	Long Integer	288
59	PSI	Single	3.69
60	LIRI	Integer	
61	RIRI	Integer	
62	HCS	Integer	
63	RN	Single	
64	PCR Date	Date	6/10/1996

A typical pavement condition text file exhibits the data structure shown in Figure 6.6.

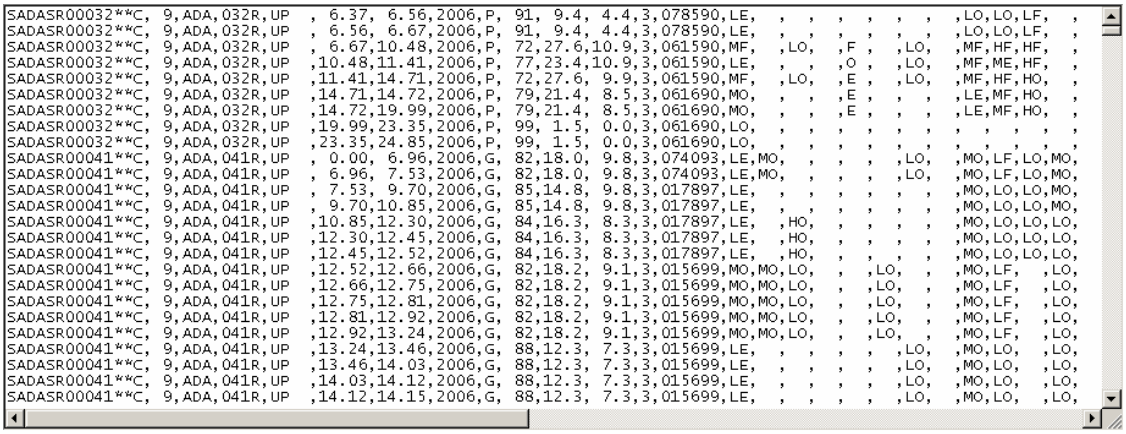


Figure 6.6 Snapshot of Pavement Condition File

6.3.2 Calculate PCR and Deducts

This tool calculates the "PCR," "Structural Deduct," "Cracking Deduct," and "Rutting Deduct" as well as individual deducts. The original pavement condition data contains "PCR," "Distress" ratings, "TDC" (Total Deduct), "STRD" (Structural Deduct), and "CRD" (Cracking Deduct). However, individual distress deducts are not provided. This tool enables a user to calculate all necessary fields for future analysis. In fact, any table with distress information can be used with this tool. However, its main purpose is to populate *DATA_ODOT* table.

Figure 6.7 shows the tool interface. Select the table in the "Tables" list box. Check the required deducts to be calculated fields in the "Options" frame, and select the year for which the PCR and deducts needs to be calculated. Click "Calculate" to fill the selected table with the selected fields.

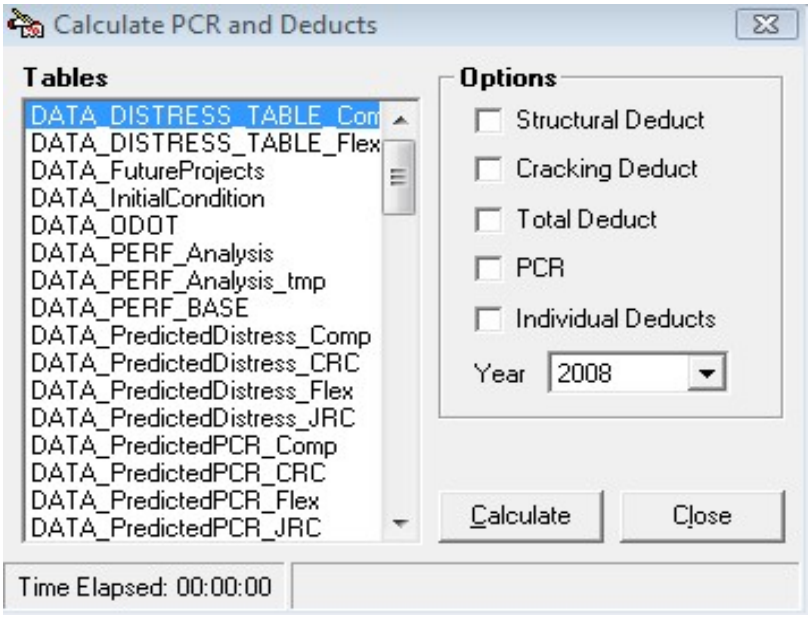


Figure 6.7 Calculate PCR and Deducts

6.3.3 Calculate PQI

This tool is used to calculate the Pavement Quality Index (PQI). PQI represents a combination of PCR and IRI (average of LIRI and RIRI). PQI is calculated by Equation 6.1.

$$PQI = PCR - a \times IRI^{b}, \quad (6.1)$$

Where a and b are read from *LU_PQIParameters* table.

6.4 APPARENT PROJECTS DETERMINATION

Note: This tool must be run before using the "Generating Performance Base Table" and "Generate Performance Analysis Table" functions.

This tool creates a new table called *DATA_Project History_Apparent* in the database that is similar to *DATA_Project History*. However, this table contains extra fields such as "App Blog," "App Elog," and "App Year" which are determined from matching PCR jumps with treatments. This tool also creates 999's and 995's if it finds a PCR jump of greater than or equal to 6, but does not find a corresponding matching treatment. DATA_PERF_BASE and DATA_PERF_ANALYSIS are generated based on this table.

6.5 GENERATE PERFORMANCE BASE TABLE

This tool generates the *DATA_PERF_BASE* table. The *DATA_PERF_BASE* table is the base of most analysis functions and should be generated before *DATA_PERF_ANALYSIS*. Note: It is recommended to perform a database compacting operation before and after using this function.

6.6 GENERATE PERFORMANCE ANALYSIS TABLE

This tool generates the *DATA_PERF_ANALYSIS* table from the *DATA_PERF_BASE* table. Most of the analysis tools in ODOTPMIS use this table. Note: It is recommended to perform a database compacting operation before and after using this function.

6.7 GENERATE COST LOOKUP TABLE

To perform an "Average Cost" analysis of projects, a lookup table *LU_COST* is required to begin analysis. This tool is used to generate the *LU_COST* table.

6.8 POPULATE PERFORMANCE BASE TABLE

The "Populate Performance Base Table" function opens a window to display variances of user specified attributes in *DATA_ODOT* over time with respect to specified values of *DATA_Project History*.

This tool replaces the "Key" and "Entry" numbers in the *DATA_PERF_BASE* table. The keys are replaced with the selected values in the "DATA_ODOT" list box and entries are replaced with selected parameter values in "DATA_Project History" list box.

Note: The resultant table cannot exceed 256 columns in width. Thus, if many parameters are desired, the number of years selected should be decreased or conversely, if many years are selected, the number of parameters may need to be reduced.

Source Table: DATA_PERF_BASE, DATA_Project History_Apparent, DATA_ODOT
Output Table: The default name is *Result_Base*. However, the user can assign a different table name by changing the text in the "Output Table Name" textbox.

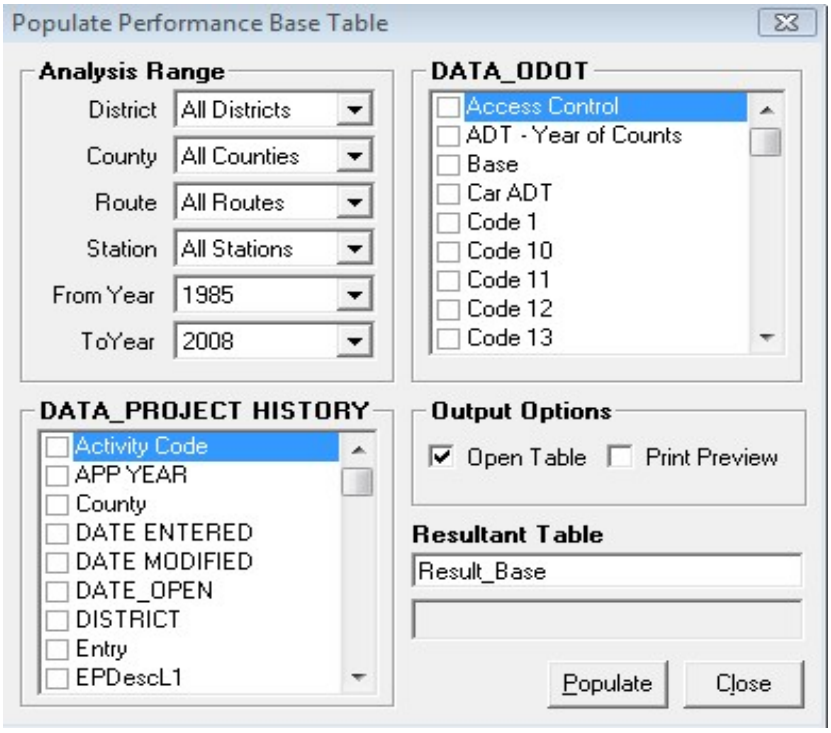


Figure 6.8 Populate Performance Base Table

6.9 POPULATE PERFORMANCE ANALYSIS TABLE

The "Populate Performance Analysis Table" tool determines the changes of selected DATA_ODOT values between consecutive projects on the same pavement section with respect to data in DATA_Project History_Apparent.

This tool replaces the key and entry numbers in the *DATA_PERF_ANALYSIS* table with the selected values. The Fields Corresponding to Entry-1, Entry and Entry2 List boxes are used to select fields from *DATA_Project History_Apparent* table and Fields Corresponding to Key List box is used to select fields from *DATA_ODOT* table. Like the Populate Performance Base Table tool, the resultant table can support a maximum of 256 columns of data.

Source Table: DATA_PERF_ANALYSIS, DATA_Project History, DATA_ODOT
Output Table: The default name is *Result_Analysis*. However the user can assign a different table name by changing the text in the "Output Table Name" textbox.

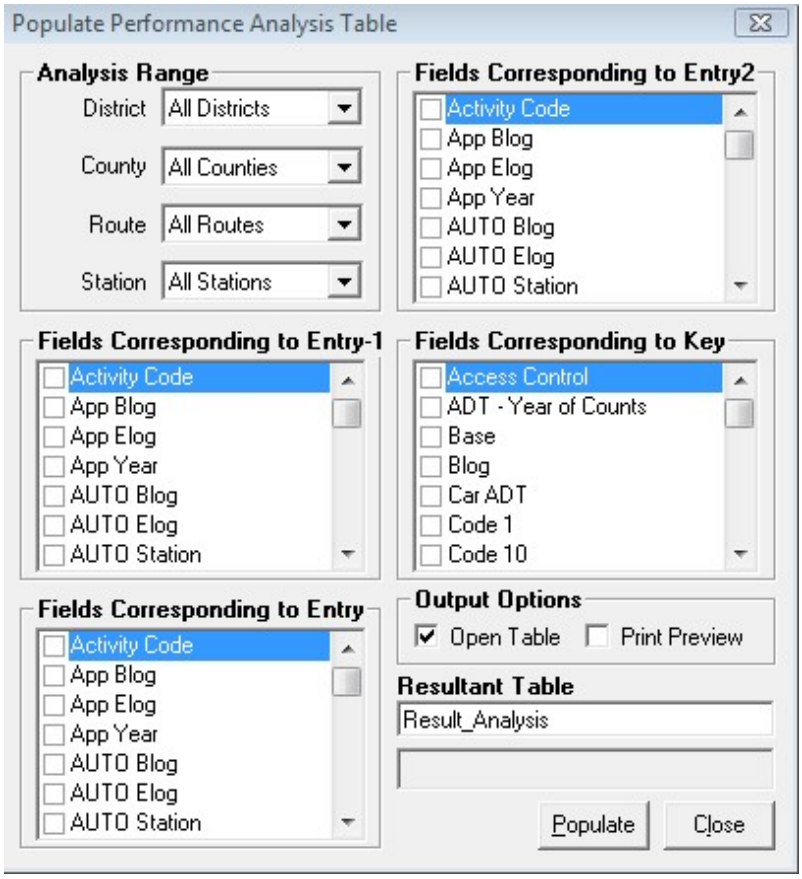


Figure 6.9 Populate Performance Analysis Table

6.10 POPULATE DISTRICT FIELD

This tool is used to populate the district field in a table, provided the selected table contains a "County" field.

6.11 IMPORT PLANNED PROJECTS

This tool allows the importing of a work plan into ODOTPMIS. Generally, the work plan file contains the planned treatments for the future, project cost, and location information. The imported file is stored in *DATA_FutureProjects*. Each time this tool is used to import a new work plan, the previous existing work plan in ODOTPMIS is overwritten. To import condition data correctly, the source data file must have the required format.

Stored Table: DATA_FutureProjects
Data file type: Microsoft Excel File
Data format: Shown in Table 6.3

In the work plan file, certain columns can be left empty if they do not contain data. However, the necessary fields (bolded) “PID,” “NLF ID,” “County Begin Number,” “County End Number,” and “Pavement Treatment Type” should contain values.

Table 6.3 Work Pkan File Format

Order	Field Name	Example
1	**PID**	21052
2	SUM Adjusted Total Amt	8300000
3	Sale Amount	
4	District	
5	Project Name (ie CRS)	
6	Primary Work Category	
7	Award Date Current	
8	Award Date Actual	
9	Requested STIP Yr	2009
10	**NLF ID**	SLUCSR00002**C
11	**County Begin Number**	30.23
12	**County End Number**	30.8
13	Actual Priority Miles	0
14	Actual Urban Miles	0
15	Actual General Miles	1.14
16	MAX Pvmt Treat Category Cd	
17	**Pavement Treatment Type**	60 - AC Overlay with Repairs

6.12 GENERIC CLASSIFICATION TOOL

This tool, shown in Figure 6.10, is used to classify numerical fields in a table. If the original field name in the table is [fieldname], a new field called [fieldname classification] will be added to the table.

If the table selected is [DATA_PERF_ANALYSIS], this field will automatically show in the “Group By” list box provided on most of the analysis tools, such as “Average Deterioration Trend,” “Time To Treatment (Actual),” “Time To Treatment Survival Analysis” and “Derived Performance Trend.”

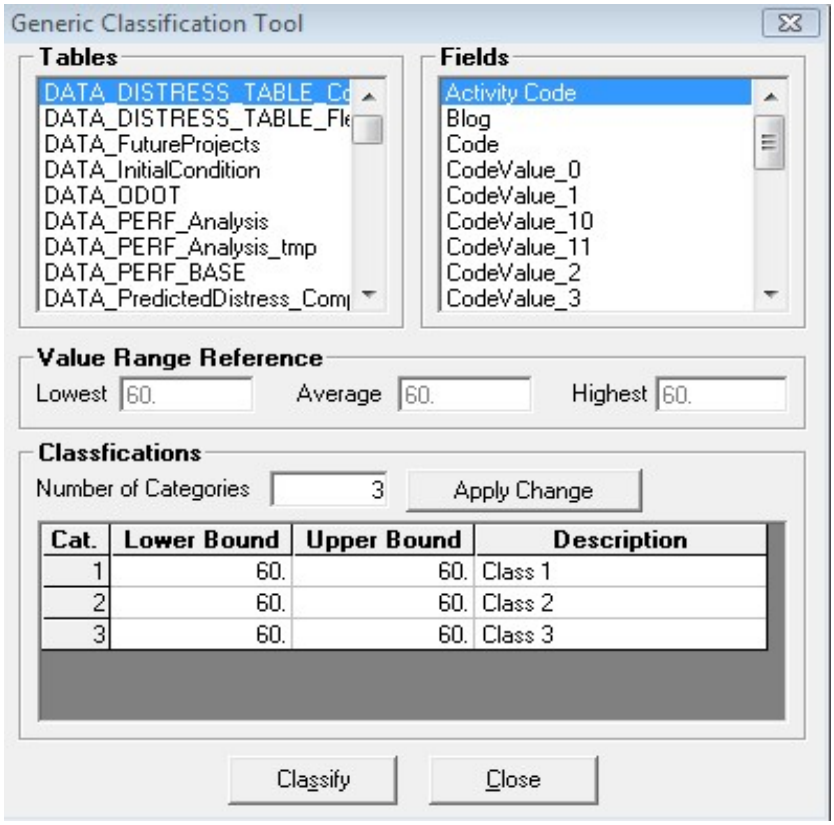


Figure 6.10 Generic Classification Tool

Value Range Reference Options

Lowest: Lowest value of the parameter
Average: Average value of the parameter
Highest: Highest value of the parameter

Classifications Options

Number of Categories: Number of categories to classify the selected "Fields"
Apply Change (button): Enter number of categories in the "Number of Categories" text box and click this button to change the categories
Lower Bound: Lower bound/limit of a category (This value cannot be changed.)
Upper Bound: Upper bound/limit of a category (This value can be changed. The changed value becomes the lower bound of the next category.)
Description: The description of each category. This description for each category of fields is stored as a new field in the table.

Example:

The following example classifies AvgESAL in [DATA_PERF_ANALYSIS] into two categories: High, If ESAL ≥ 1500 and Low if ESAL < 1500.

1. Open the "Generic Classification Tool"
2. In the "Tables" list select "DATA_PERF_ANALYSIS"
3. In the "Fields" list select "AvgEsal"

4. Change the number of categories to 2 and click the “Apply Change” button
5. Change the Upper bound of Category 1 to 1500 and change its description to “Low”
6. Change the description of Category 2 to “High”
7. Click the “Classify” button
8. Close the tool and open the “Average Performance Trend” under the “Report” menu. “AvgEsal Classification” will be displayed in the “GroupBy” list.

6.13 LINEAR SUPERPOSITION

The “Linear Superposition Operation” is a merge of multiple tables to obtain a single dynamically segmented table. The output is stored in the “Output Table.” If the output table named in the input box already exists, the tool will ask the user to replace the existing table or exit from the tool. Figure 6.11 shows the user interface.

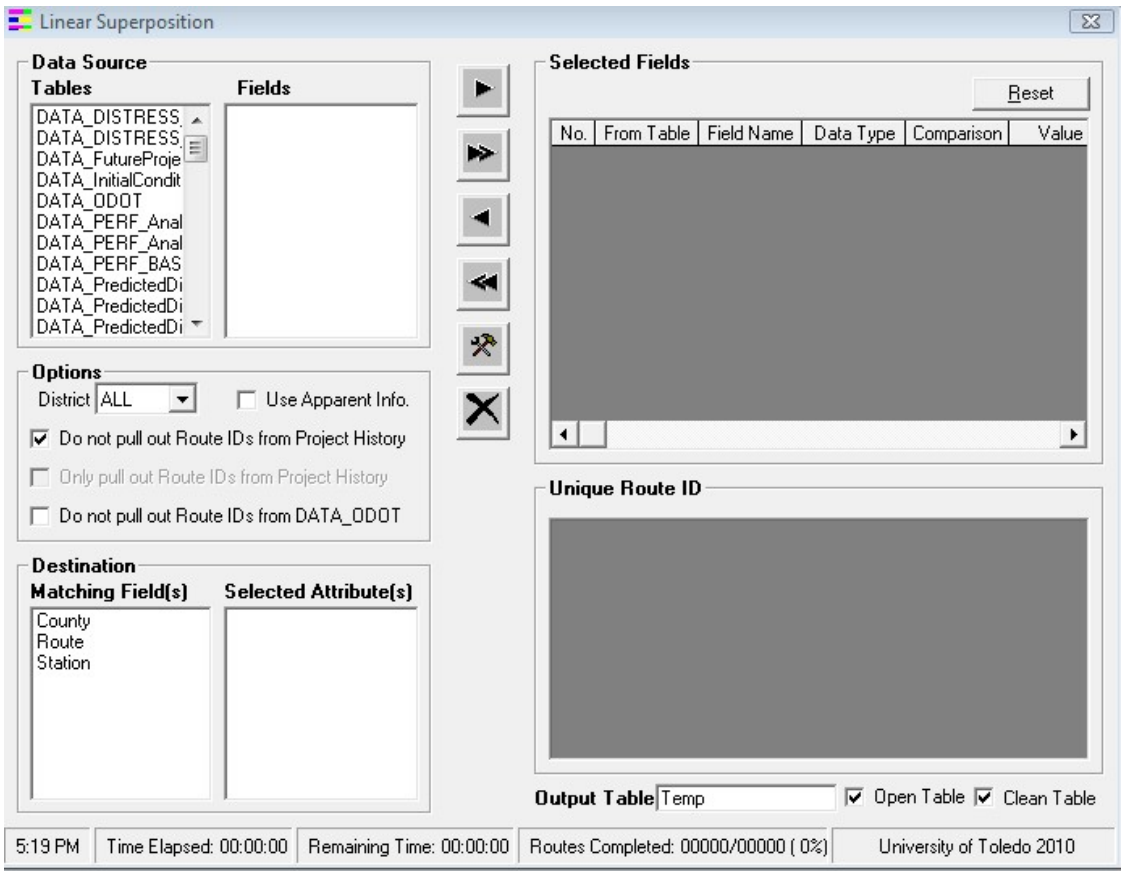


Figure 6.11 Linear Superposition User Interface

Commands

Tables: Lists all the tables in the database
Fields: Lists all the fields of the table selected under “Available Tables”
Selected Fields: Lists all the selected fields from “Fields”

The attributes listed in the "Fields" list box can be added to the query in three ways:

1. Select a field in the "Fields" list and drag it into the "Selected Fields" list (a hand icon will appear when dragging and dropping)

2. Double click a field to be selected under "Fields"

3. Select a field under "Fields" and click 

The "Selected Field" window also provides the option of constraining the records selected for merging. The comparison field in the "Selected Field" window provides a drop down list of how the constraint is to be implemented (≥, ≤, >, <, or =). The "Value" column specifies the desired value of the constraint.

Matching Fields

The "Matching Field" sub-window lists the fields required for merging. The default selections are "County," "Route," and "Station," as they typically specify a linear feature. In some situations, "Year" may also be included.

Adding Matching Fields

Two techniques exist for adding additional selections into the "Matching Field" box. To remove a matching field, double click a field in the "Matching Fields" sub-window.

1. Double click on field under "Selected Fields"
2. Select a field under "Selected Fields" and drag it to the "Matching Fields" box

The "Pull Out" option check boxes under "Options" limit the tables used to create internal program indices. Consequently, if DATA_Project History or DATA_ODOT is excluded in the analysis, its respective index should not be pulled out.

The "Unique Route ID" window displays all unique linear features specified in the merge. Each button is assigned a specific operation and described below.

 Add a selected field

 Add all fields from a table

 Remove a selected field

 Remove all the selected fields

 Run the linear superposition operation

 Stop the linear superposition operation

Reset the values in the "Comparison" and "Value" columns of "Selected Fields"

Example 1:

The following example shows how to obtain the PCR History for Route 032R in Adams County.

1. Select DATA_ODOT in the "Tables" list
2. Select PCR in the "Fields" list, and double click it to include it in the "Selected Fields" list
3. Under the "Fields" list, add "County" and "Route"
4. In the "County" row, double click the "Value" column and enter "ADA"
5. In the "Route" row, double click the "Value" column and enter "032R"
6. Click the  button

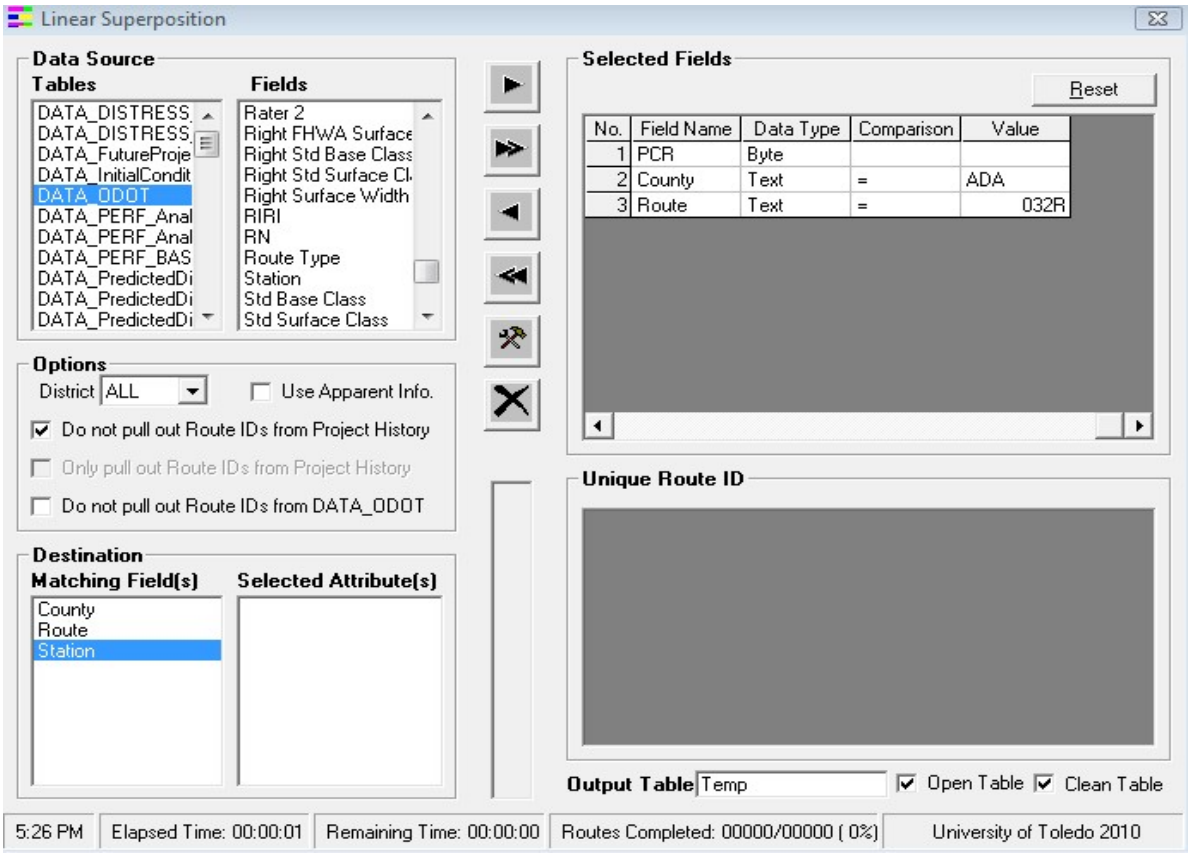


Figure 6.12 Get PCR Series for Route 032R in Adams County

The result should resemble Figure 6.13.

Note: Not all PCRs are displayed because of the size of the window. Scroll to reveal the hidden PCRs.

Table: Temp

County	Route	Station	Blog	Elog	PCR_1985	PCR_1986	PCR_1987	PCR_1988	PCR_1989	PCR_1990	PCR
ADA	032R	DOWN	0	0.35	89	91	88	86	87	73	
ADA	032R	DOWN	0.35	2.33	89	91	88	86	87	73	
ADA	032R	UP	0	2.33	89	91	88	86	87	73	
ADA	032R	DOWN	2.33	2.84	89	91	88	86	87	73	
ADA	032R	UP	2.33	2.84	89	91	88	86	87	73	
ADA	032R	DOWN	2.84	6.29	89	91	78	81	84	78	
ADA	032R	UP	2.84	6.29	89	91	78	84	84	77	
ADA	032R	DOWN	6.29	6.67	89	91	79	79	80	99	
ADA	032R	UP	6.29	6.67	89	91	79	83	78	99	
ADA	032R	DOWN	6.67	6.8	89	91	79	79	80	99	
ADA	032R	UP	6.67	6.8	89	91	79	83	78	99	
ADA	032R	DOWN	6.8	7.73		91	79	79	80	99	
ADA	032R	UP	6.8	7.73		91	79	83	78	99	
ADA	032R	DOWN	7.73	9.13	75	91	79	79	80	99	
ADA	032R	UP	7.73	10.48	72	91	79	83	78	99	
ADA	032R	DOWN	9.13	11.04	75	91	79	79	80	99	
ADA	032R	UP	10.48	11.21	72	91	79	83	78	99	
ADA	032R	UP	11.21	11.41	72	91	79	83	78	99	
ADA	032R	DOWN	11.04	14.71	75	91	79	79	80	99	
ADA	032R	UP	11.41	14.71	72	91	79	83	78	99	

Record: 1 of 29

Figure 6.13 PCR Series for Route 032R in Adams County

Example 2:

To obtain the treatment history as well as the PCR history for Route 032R in Adams County, follow this procedure:

1. Select DATA_Project History in the “Tables” list
2. Double click “Activity Code” in the “Fields” list to include it in the “Selected Fields” list
3. Select DATA_ODOT in the “Tables” list
4. Double click “PCR” in the “Fields” list to include it in the “Selected Fields” list
5. Add “County” and “Route to the “Selected Fields” list
6. In the “County” row, double click the “Value” column and enter “ADA”
7. In the “Route” row, double click the “Value” column and enter “032R”
8. Click the  button
9. After above 8 operations, the interface looks like the following figure

At this point, the “Linear Superposition” window should resemble Figure 6.14.

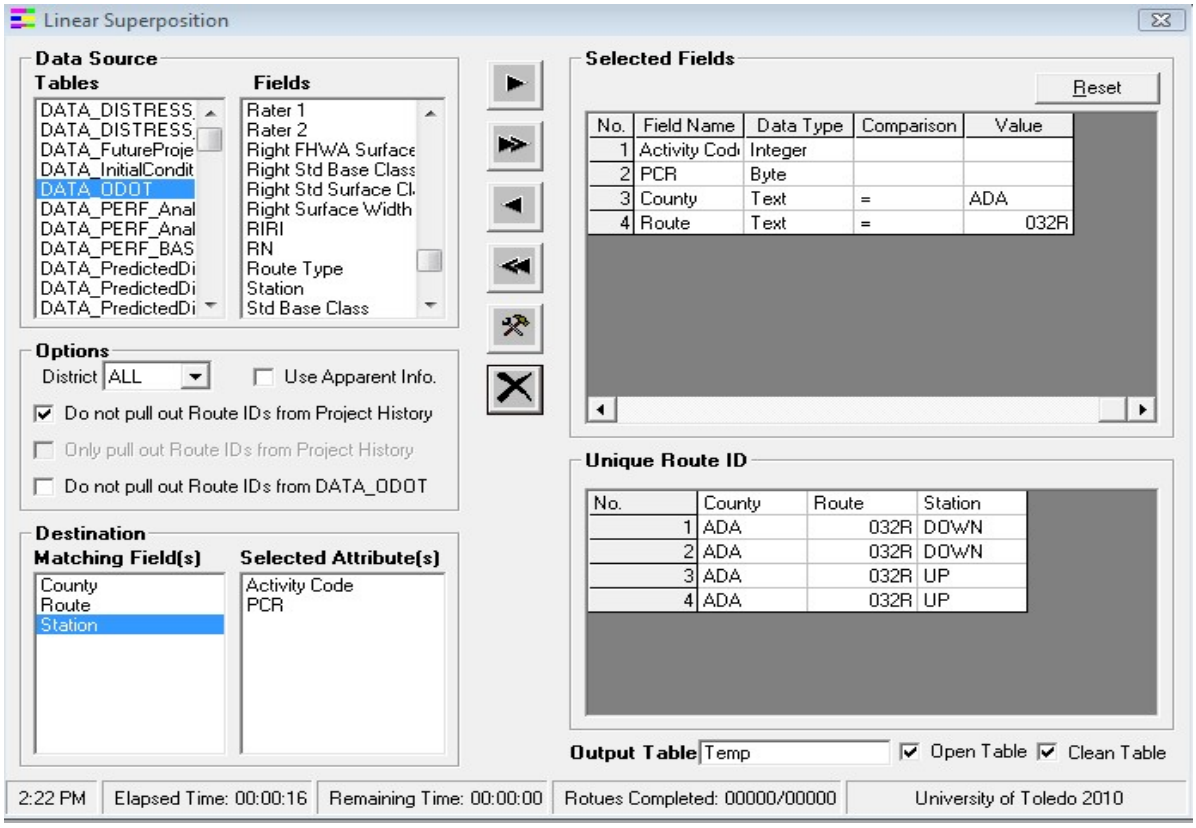


Figure 6.14 Get PCR and Treatment History for Route 032R in Adams County

The result should resemble Figure 6.15.

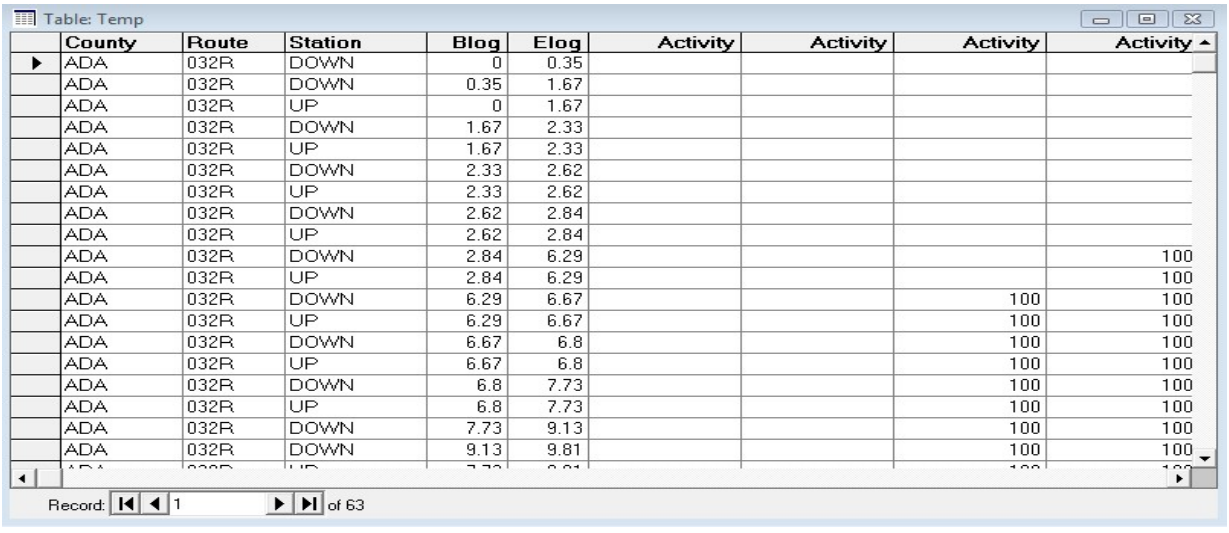


Figure 6.15 PCR and Treatment History for Route 032R in Adams County

6.14 CLEAN PAVEMENT DATA TABLE

This tool is used to remove redundancy in dynamically segmented tables. For example, the two records in Table 6.4 represent consecutive sections in a road and are identical except for the "Blog" and "Elog" figures. Therefore, these two records can be merged.

Table 6.4 Original Data

County	Route	Station	Blog	Elog	Year	PCR
ADA	032R	Down	2.33	2.84	2002	91
ADA	032R	Down	2.84	6.29	2002	91

Table 6.5 Data After Using Clean Pavement Data Table Function

County	Route	Station	Blog	Elog	Year	PCR
ADA	032R	Down	2.33	6.29	2002	91

6.15 MODIFY ACTIVITY LEGEND

This tool is used to add new activity codes, modify activity legend colors for project history checking, and ensure data integrity between the activity code and the modified activity code.

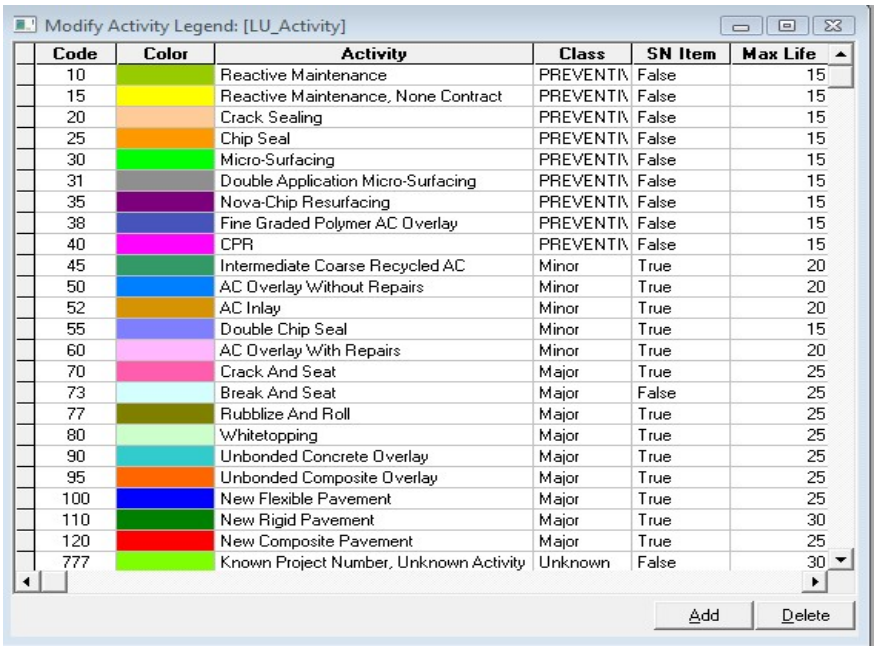


Figure 6.16 Modify Activity Legend

To add a new activity code, click "Add." This will add a new row at the end of the window (Figure 6.17). Enter the required information including the "Code" (numerical), "Color," "Activity," "Class," "SN Item," and "Max Life." Avoid entering duplicate data.

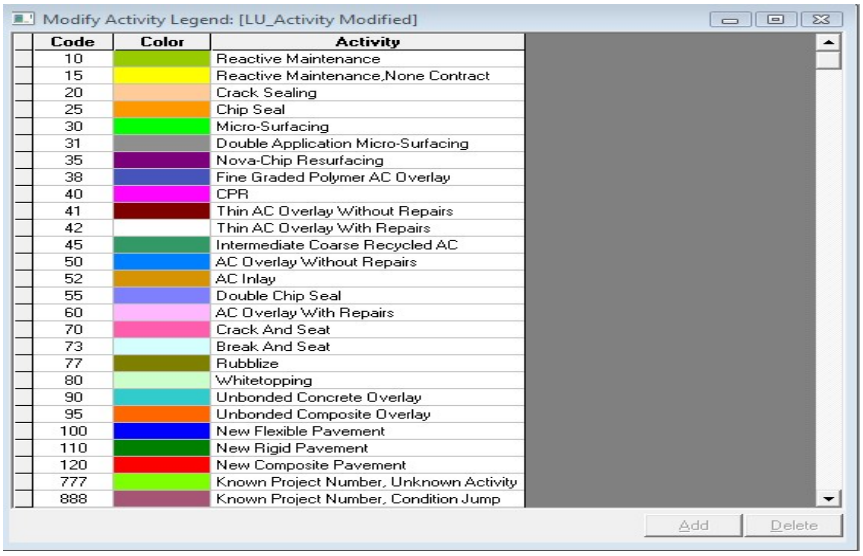


Figure 6.17 Add New Activity

6.16 EDIT LOOKUP TABLE

This tool updates the lookup tables necessary for all analyses in ODOTPMIS.

Table to Apply: [LU_XXXXX]
Tool to use: [Data] → [Edit Lookup Table]

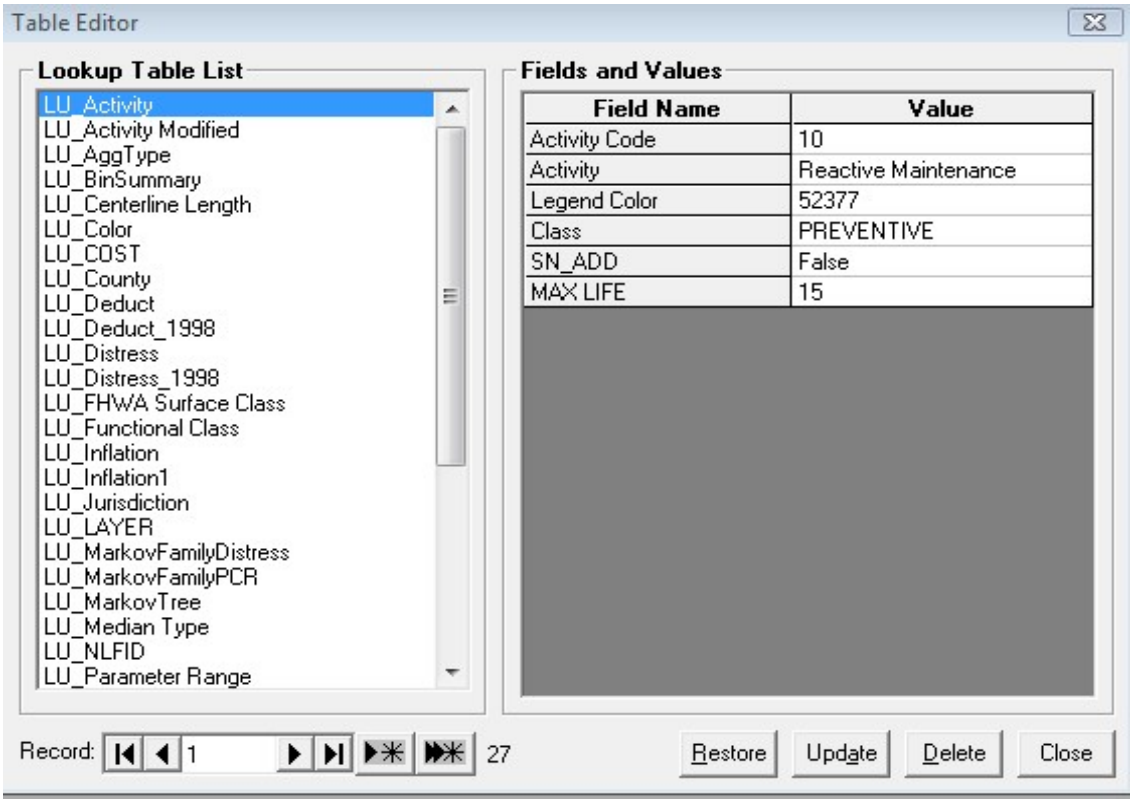


Figure 6.18 Edit Lookup Table

Users can add, modify, or delete a current record in a lookup table. However, the user cannot change the field name or add/delete a field from a lookup table.

	Record navigator
	Add a new blank record
	Copy the current record as a new record
	Restore the original record
	Update and make all changes permanent
	Delete current record. Deleted records cannot be restored.
	Close this tool

Example 1:

In the current ODOT database, only ten distresses are defined for Continuous Reinforced Concrete pavement. To change distress information for distress code 11 for pavement type 1 (Continuous Reinforced Concrete),

1. Select “Edit Lookup Table” under the “Data” menu
2. Select LU_Distress in the “Lookup Table” list
3. Go to “Pavement Type 1” and “Code 11” by using the  button in the record navigator. The interface of the tool should resemble Figure 6.19.
4. Click the “Field Name” to be changed

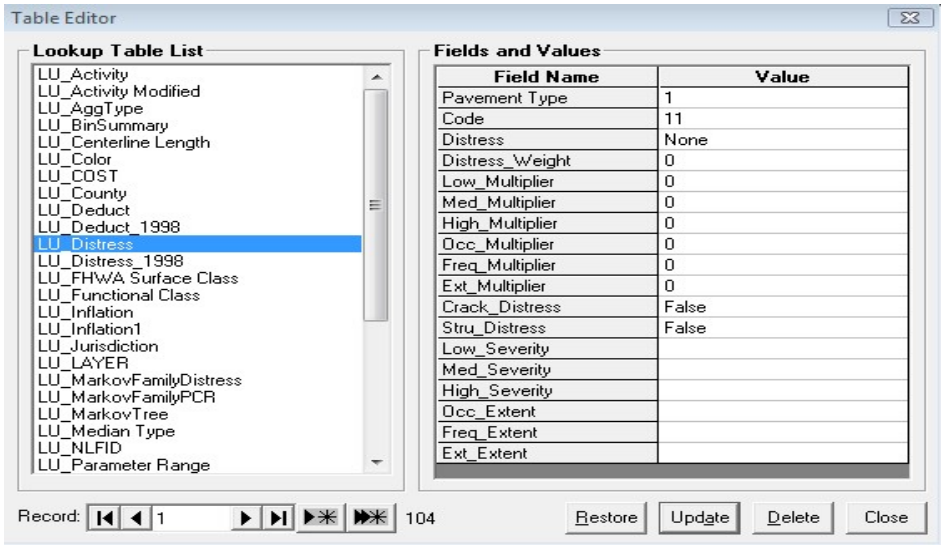


Figure 6.19 LU_Distress Table

Figure 6.20 demonstrates the valid format of the data to be entered.

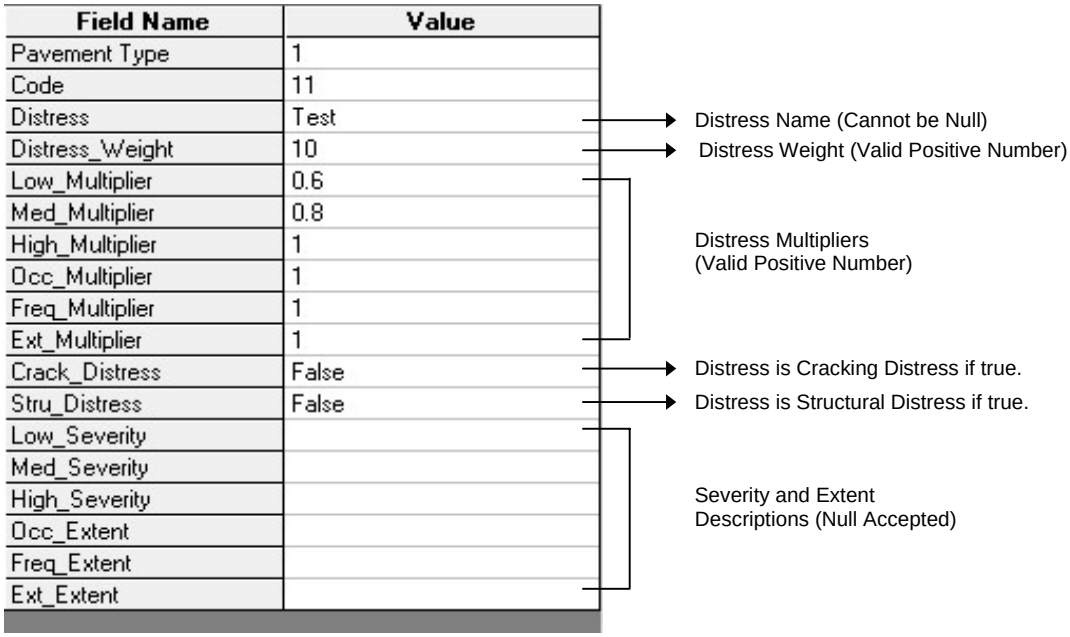


Figure 6.20 Modifying LU_Distress

5. After entering the changes, click "Update"
6. The changes will be made in two tables: LU_Distress and LU_Deduct. ODOTPMIS uses LU_Deduct table to calculate "PCR," "Structural Deduct," "Cracking Deduct," and individual deducts.
7. To restore old values, click "Restore." This only works if the user clicks the "Restore" button before closing the tool, and only restores one record at a time.

SECTION 7 - ANALYSIS TOOLS MENU

This menu contains functions that perform analyses comparing time to treatment, condition deterioration, pavement condition prediction, and remaining life estimation.

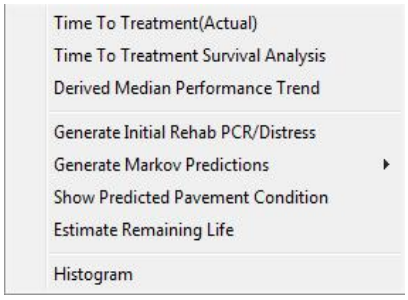


Figure 7.1 ODOTPMIS Analysis Tools Menu

7.1 EXCLUDE ACTIVITY OPTION

Analysis tools such as "Time To Treatment (Actual)," "Time To Treatment Survival Analysis," and "Derived Performance Trend" provide an option giving the user the ability to exclude certain activities from the analysis. For example, consider a pavement section with the treatment history as shown in Figure 7.2.

Figure 7.2 Example for Exclude Activity

This pavement section will not be included in the analysis if the "From Activity" is set to 50 and the "To Activity" to 50 because this tells the program to search for projects that are Activity 50 (overlay without repairs) and immediately followed by another Activity 50. However, this pavement section is included in the analysis, if both the "From Activity" and "To Activity" are set to 50, and Activity 20 is selected in the "Exclude Activity" list box.

7.2 TIME TO TREATMENT (ACTUAL)

This tool is used to determine the average time between types of treatments or the average time to a certain PCR threshold.

Source Table: DATA_PERF_ANALYSIS
Intermediate Table Generated: DATA_PERF_AVGLIFE
Output Table: The default name for the output table is "Actual Time to Treatment Analysis." Users can update this table name by changing the text in the "Output Table name" text box.

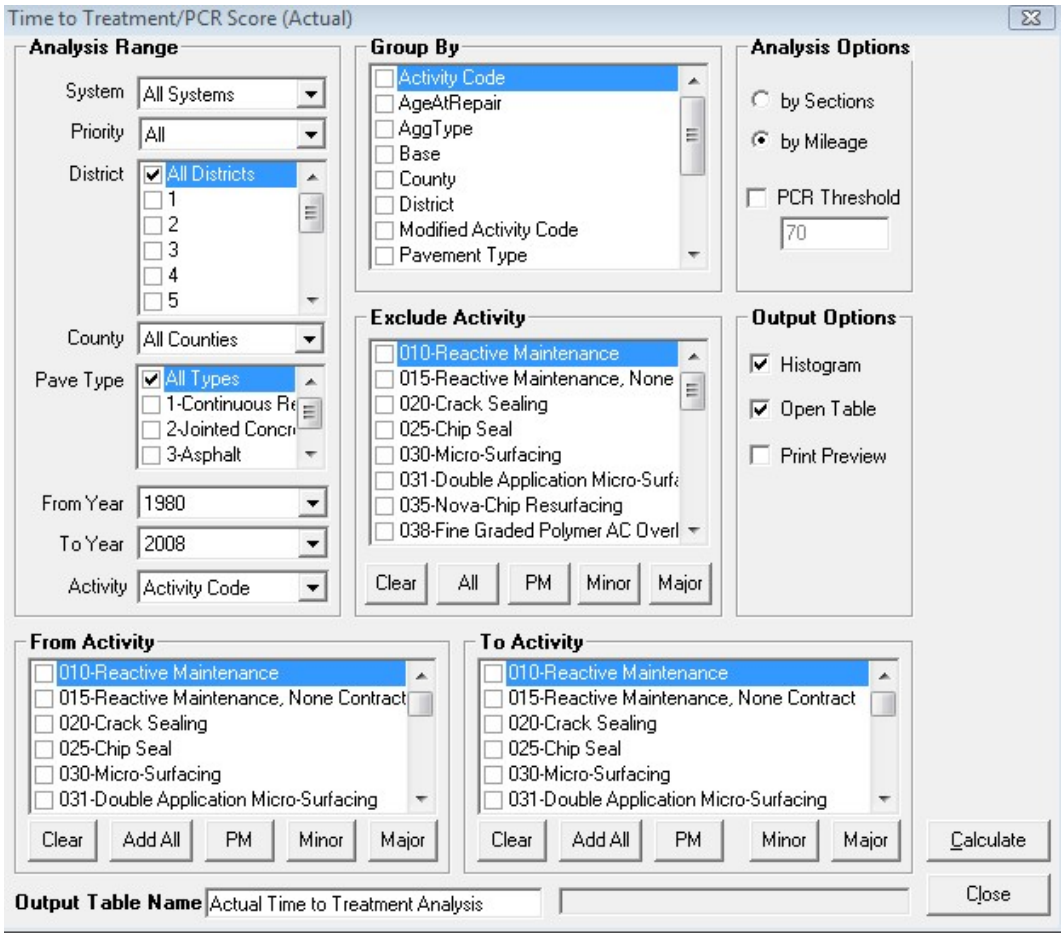


Figure 7.3 Time to Treatment (Actual)

Example 1:

To generate the "Average Life of Overlay on Priority System Flexible Pavements," select the following options on the tool:

1. "All Systems" under "System"
2. "All" under "Priority"
3. "All Districts" under "District"
4. "All Counties" under "County"
5. "All Types" under "Pave Type"
6. "All Directions" under "System"
7. "1985" under "From Year," and "2006" under "To Year"
8. "Activity Code" under "Activity" list
9. "50" and "60" under **"**From Activity" list, and "Add All" under "To Activity" list
10. "By Mileage" under "Analysis Options"

Enter an output table name in the "Output Table Name" text box and click "Calculate."

Figure 7.4 shows the mileage of pavements that failed or received treatment in each time period. The average life of an overlay on priority systems, according to the calculations, is 7.6 years.

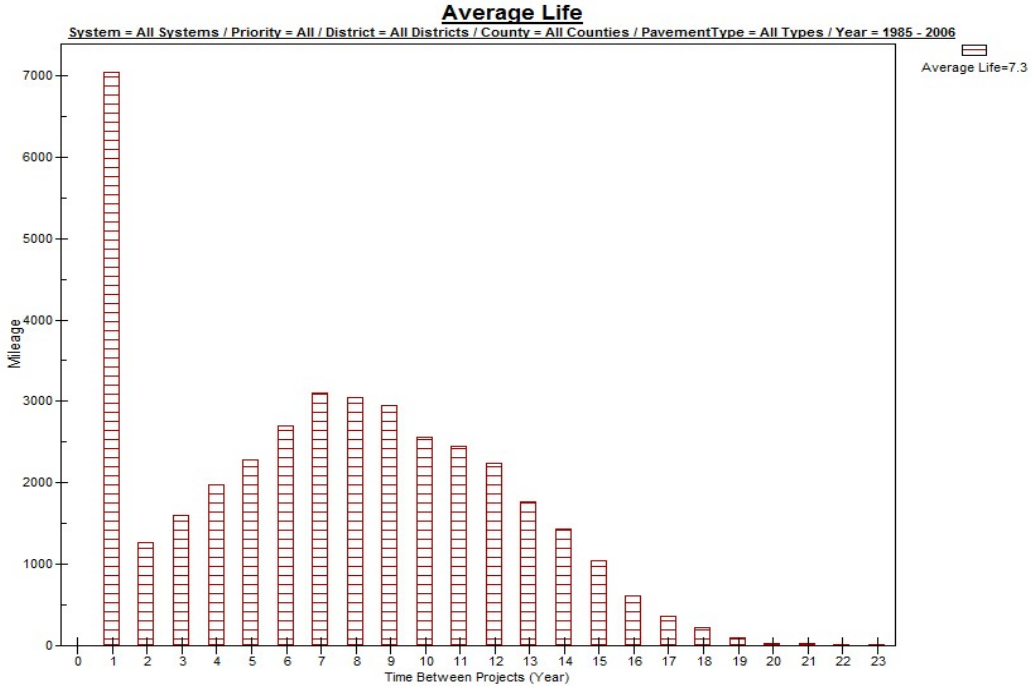


Figure 7.4 Time to Treatment (Actual) Output for Flexible Overlays on Priority System

7.3 TIME TO TREATMENT SURVIVAL ANALYSIS

This tool is used to calculate the time to the next treatment based on the Kaplan-Meier Survival Curve method. The advantage of Kaplan-Meier Survival Curve method is that it allows the inclusion of surviving pavement sections in the analysis.

Source Table: DATA_PERF_ANALYSIS
Intermediate Table Generated: DATA_PERF_REMLIFE
Output Table: The default name for the output table is "Pavement Survival Life Analysis." Users can update this table name by changing the text in the "Output Table name" text box.

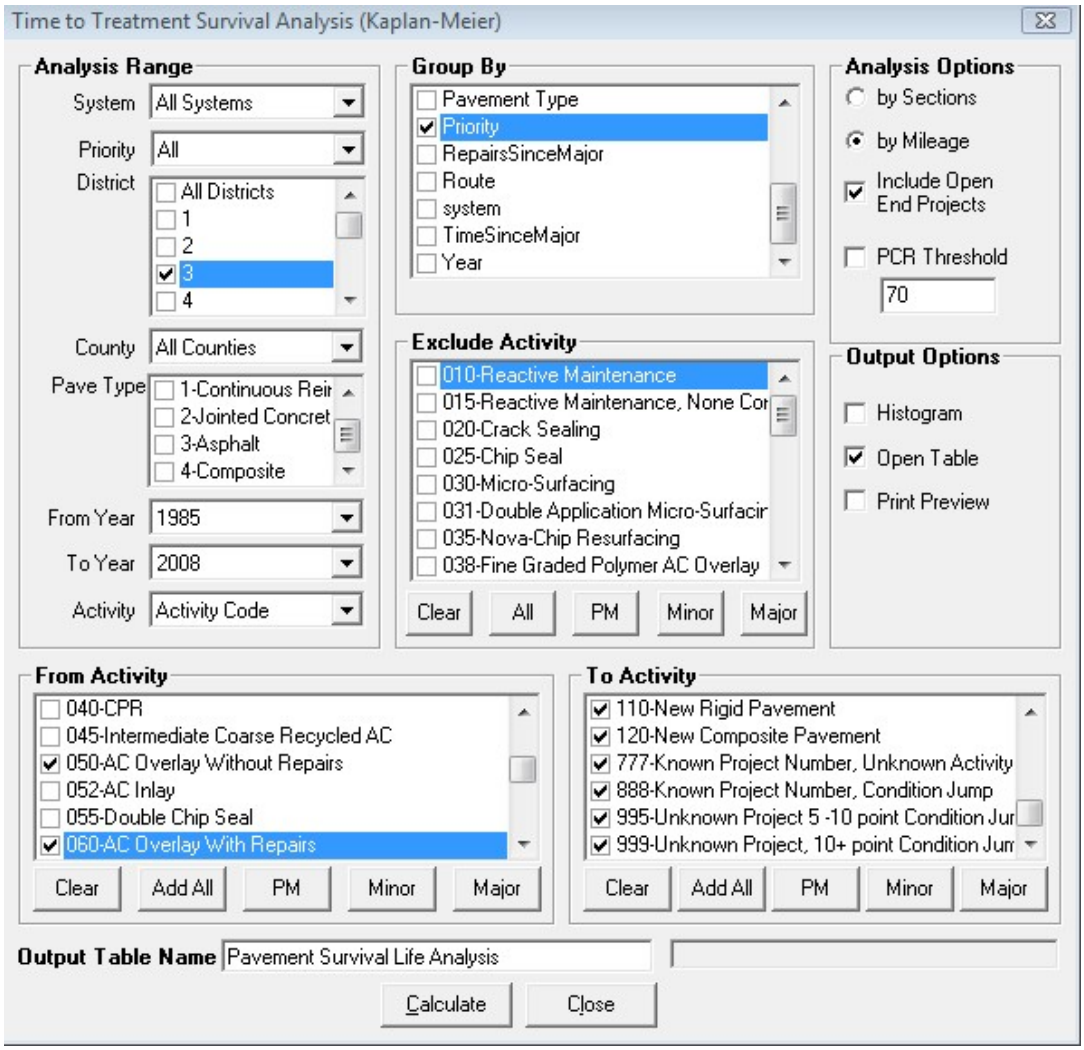


Figure 7.5 Time to Treatment Survival Analysis User Interface

Analysis Options

Include Open End Projects: Checking this option will include open-ended projects (projects or pavements still in existence)

PCR Threshold: A pavement is considered failed if it undergoes treatment. Checking this option marks all pavements with PCR levels below the threshold as failed.

Output Options

Histogram: This option plots a histogram showing the number of censored and uncensored points for each section.

Survival Analysis Output

In certain scenarios including open ended projects, the survival curve will not reach zero percent surviving. This curve is called a stub survival curve. In the PMIS, a Weibull survival function is used to complete the survival curve. The Weibull fit, along with the original survival curve, is shown in the output graph.

Example 1:

The following example shows the survival analysis of "Overlay on Priority System Flexible Pavements." Select the following options on the tool:

11. "All Systems" under "System"
12. "All" under "Priority"
13. "All Districts" under "District"
14. "All Counties" under "County"
15. "All Types" under "Pave Type"
16. "All Directions" under "System"
17. "1985" under "From Year," and "2006" under "To Year"
18. "Activity Code" under "Activity" list
19. "50" and "60" under **"**From Activity" list, and "Add All" under "To Activity" list
20. "By Mileage" under "Analysis Options"

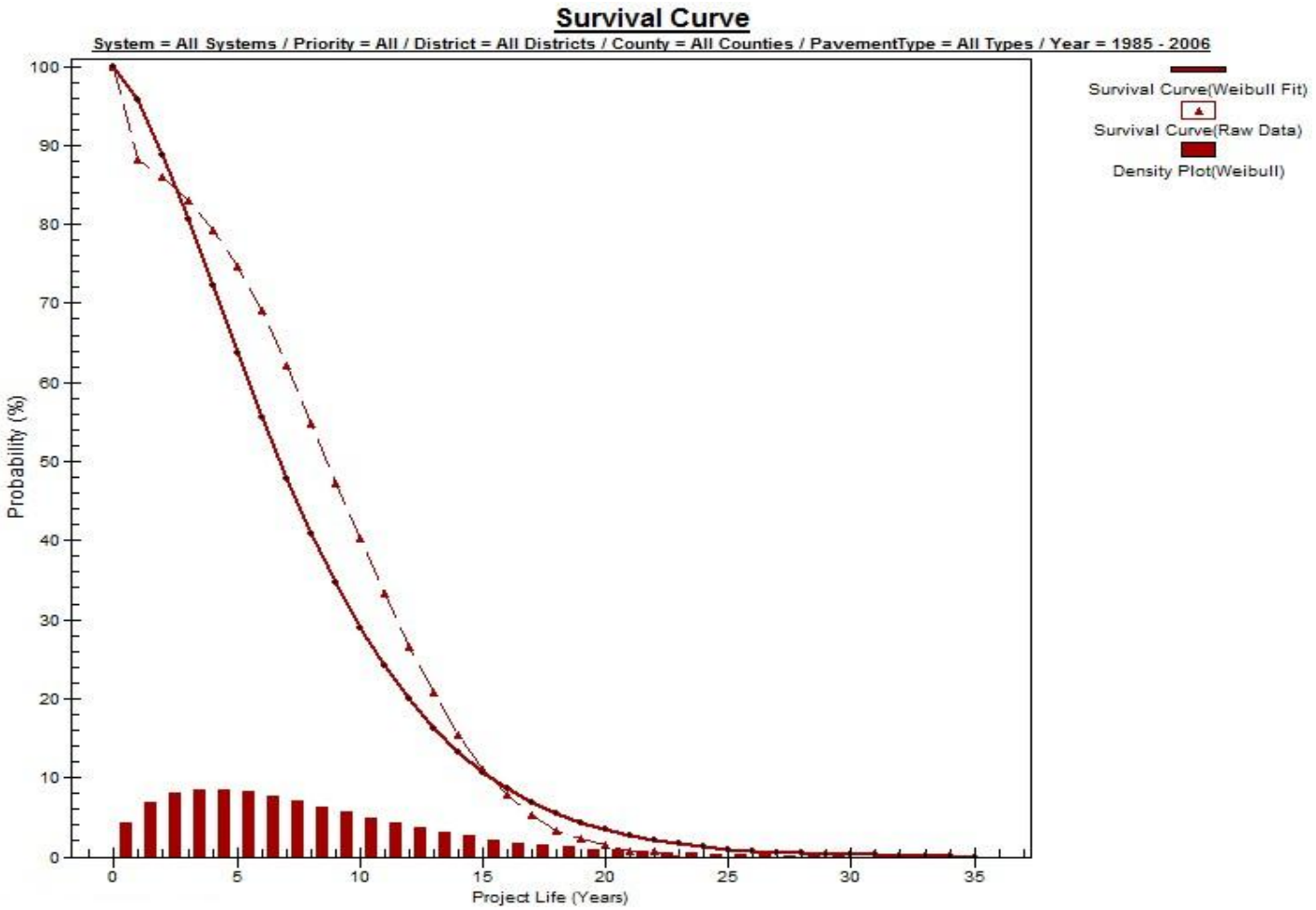


Figure 7.6 Time to Treatment (Actual) Output for Overlays on Priority System

A histogram showing mileages of projects that have been repaired and still exist can also be generated by selecting "Histogram" under "Output Options." Figure 7.7 shows the mileage histogram for the survival curve in Figure 7.6.

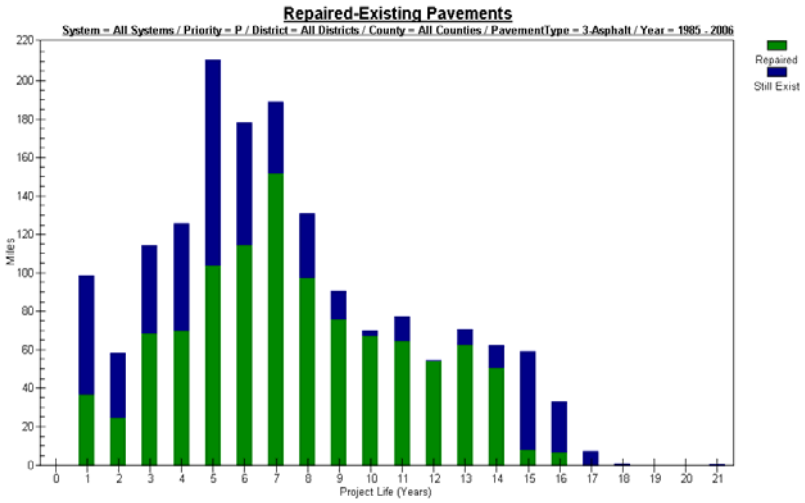


Figure 7.7 Time to Treatment Survival Curve Mileage Histogram

7.4 DERIVED PERFORMANCE TREND

This tool analyzes the series of survival curves to determine the pavement condition deterioration of a group of user specified pavement repairs.

Source Table: DATA_PERF_ANALYSIS, DATA_ODOT
Intermediate Table Generated: DATA_PERF_ SURVIVAL
Output Table: The default name for the output table is "Derived Performance." The user can change this table name by updating the text in the "Output Table Name" text box.

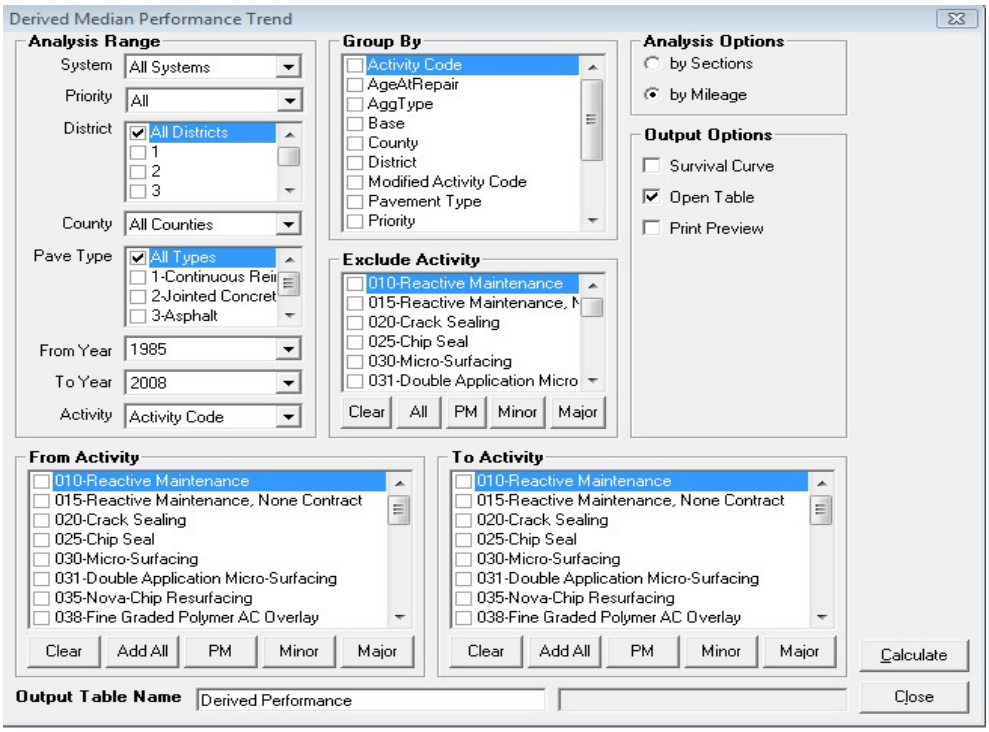


Figure 7.8 Derived Performance Trend

Output Options

Survival Curve: Display survival curves for PCR from 100 to 50.

Example 1:

The following example shows the Derived Performance Trend for District 3 General System Flexible Pavements with Overlays. Select the following options on the tool:

1. "All Systems" under "System"
2. "G" under "Priority"
3. "All Districts" under "District"
4. "All Counties" under "County"
5. "All Types" under "Pave Type"
6. "All Directions" under "System"
7. "1985" under "From Year," and "2006" under "To Year"
8. "Activity Code" under "Activity" list
9. "50" and "60" under **"**From Activity" list, and "Add All" under "To Activity" list
10. "By Mileage" under "Analysis Options"
11. Check "Survival Curve" under "Output Options"

Enter an output table name in the "Output Table Name" text box and click "Calculate."

Figure 7.9 shows the "Derived Performance Curve."

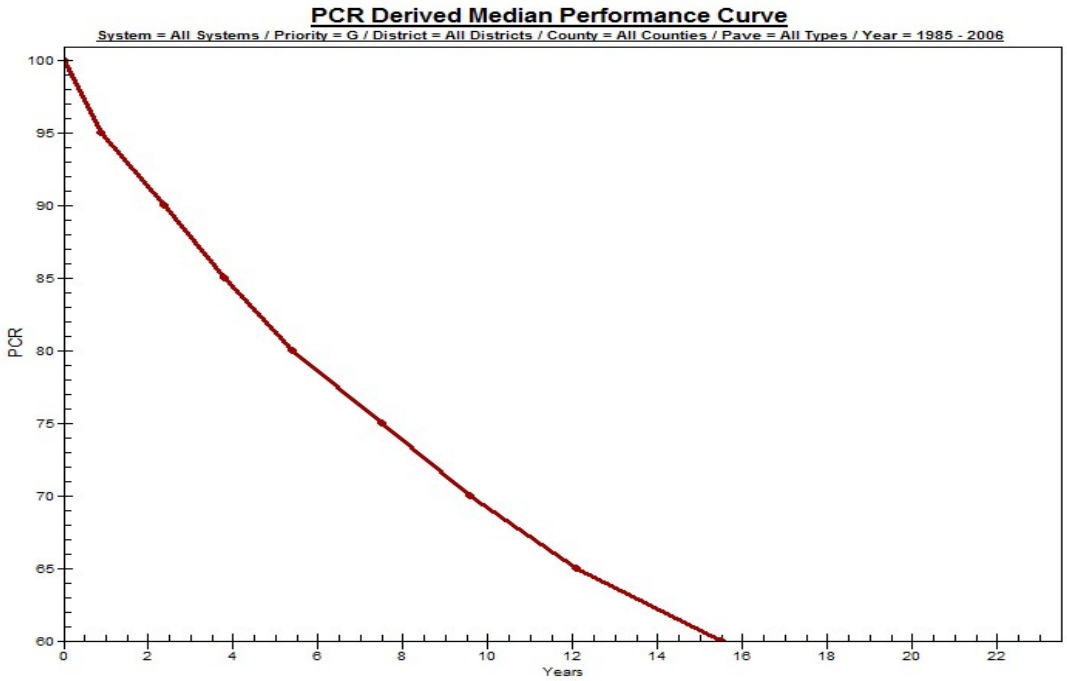


Figure 7.9 Derived Median Performance Curve For District 3 General System Flexible Pavements with Overlays

This tool also generates the survival curves used for the "Derived Median Performance Curve" shown in the following figure. It can be seen that Weibull curves are used instead of stub survival curves.

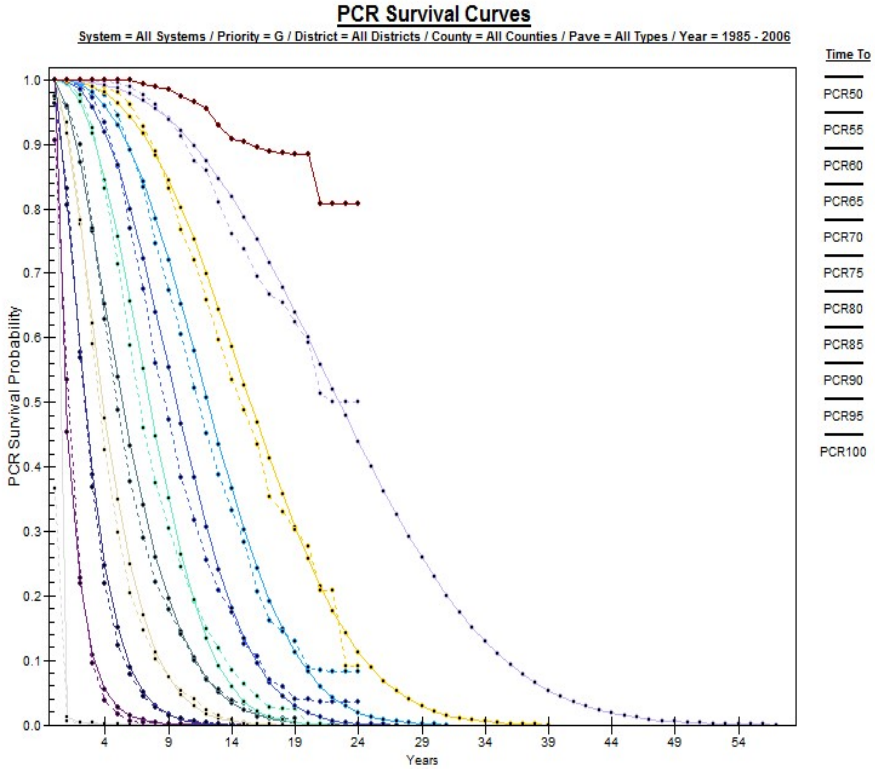


Figure 7.10 PCR Survival Curves

7.5 GENERATE MARKOV PREDICTIONS

This menu can be used to predict the PCR and distress for every pavement section in the database based on Markov process. However, for certain groups of pavements, the Markov transition matrix cannot be generated since only a few pavement sections are available. In that case, simple linear extrapolation is used for predicting distress and PCR.

The tools available under this menu are "Statewide Rigid Pavements," "Statewide Flexible Pavements," "Statewide Composite Pavements," "Individual Pavement Prediction," and "Selected Predictions."

The transition matrix table *DATA_TransitionMatrix* is created when using the "Statewide Rigid Pavements," "Statewide Flexible Pavements," and "Statewide Composite Pavements" options. Note: It is recommended that the user not delete this table, since it is used in the "Individual Pavement Prediction" and "Show Pavement Prediction" tools.

7.5.1 Statewide Rigid Pavements

This option generates statewide rigid pavement PCR and distress predictions for the next twenty years. Four tables will be generated. Note: It is recommended that the user not delete these tables unless new pavement condition data and/or project data are added in the database.

The tables created are: *DATA_PredictedPCR_JRC, DATA_PredictedDistress_JRC, DATA_PredictedPCR_CRC, and DATA_PredictedDistress_CRC.*

7.5.2 Statewide Flexible Pavements

This option generates statewide flexible pavement PCR and distress predictions for the next twenty years. Two tables will be generated. It is recommended that the user not delete these tables unless new pavement condition data and/or project data are added in the database.

The tables created are: *DATA_PredictedPCR_Flex, DATA_PredictedDistress_Flex.*

7.5.3 Statewide Composite Pavements

This option generates statewide composite pavement PCR and distress predictions for the next twenty years. Two tables will be generated. It is recommended that the user not delete these tables unless new pavement condition data and/or project data are added in the database.

The tables created are: *DATA_PredictedPCR_Comp, DATA_PredictedDistress_Comp.*

7.5.4 Individual Pavement Prediction

This tool can be used to view the predicted PCR of an individual pavement section. Markov prediction is combined with Monte-Carlo simulation to generate the PCR

predictions and confidence intervals. The user has the ability to choose between various confidence intervals. Figure 7.11 shows the user interface.

Source Table: DATA_Transition Matrix

Output Table: The default name for the output table is "Pavement Section Prediction." Users can update this table name by changing the text in the "Output Table name" text box.

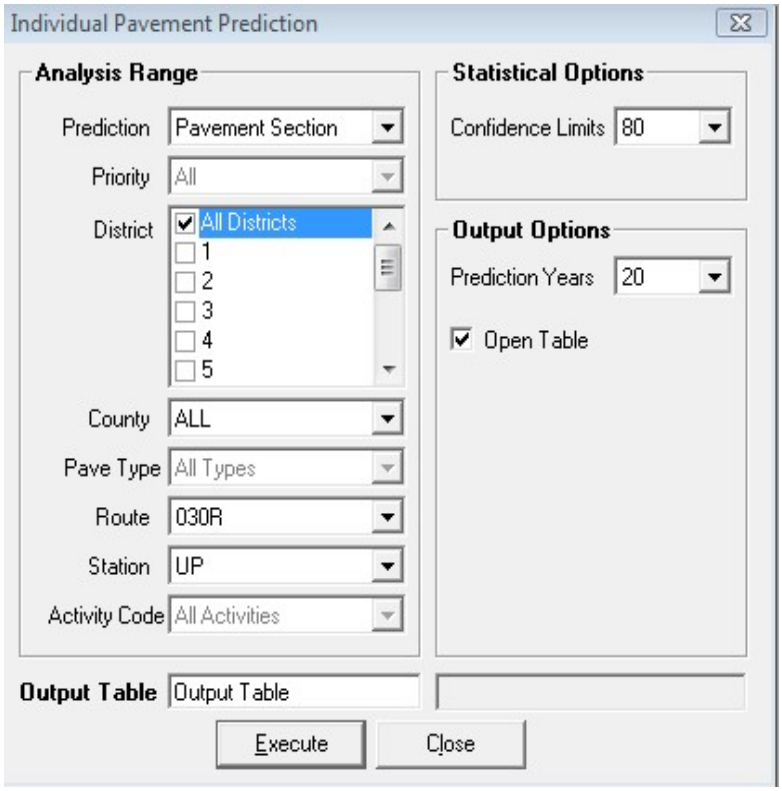


Figure 7.11 Individual Pavement Section Prediction

Example 1:
To view the predicted PCR for Allen County, Route 030R Up Direction, for the next twenty years with an 80% confidence limit, select following options:

1. "All" under "County"
2. "030R" under "Route"
3. "UP" under "Station"
4. "80" under "Confidence Limits"
5. "20" under "Prediction Years"

Enter an output table name in the "Output Table" text box and click "Execute."

Figure 7.12 shows the output grid which displays the results.

Table: FamilyCurvePrediction

PaveID	District	County	Route	Station	Blog	Elog	Year	Pavement	Priority	Base	Activity Code	PCR	P(
1	11						1985	3	G				
1	11						1986	3	G				
1	11						1987	3	G				
1	11						1988	3	G				
1	11						1989	3	G				
1	11						1990	3	G				
1	11						1991	3	G				
1	11						1992	3	G				
1	11						1993	3	G				
1	11						1994	3	G				
1	11						1995	3	G				
1	11						1996	3	G				
1	11						1997	3	G				
1	11						1998	3	G				
1	11						1999	3	G				
1	11						2000	3	G				
1	11						2001	3	G				
1	11						2002	3	G				
1	11						2003	3	G				
1	11						2004	3	G				

Record: 1 of 1056

Figure 7.12 PCR Prediction Grid

Click on any part of the grid to generate a PCR prediction plot that shows the confidence limits as shown in Figure 7.13.

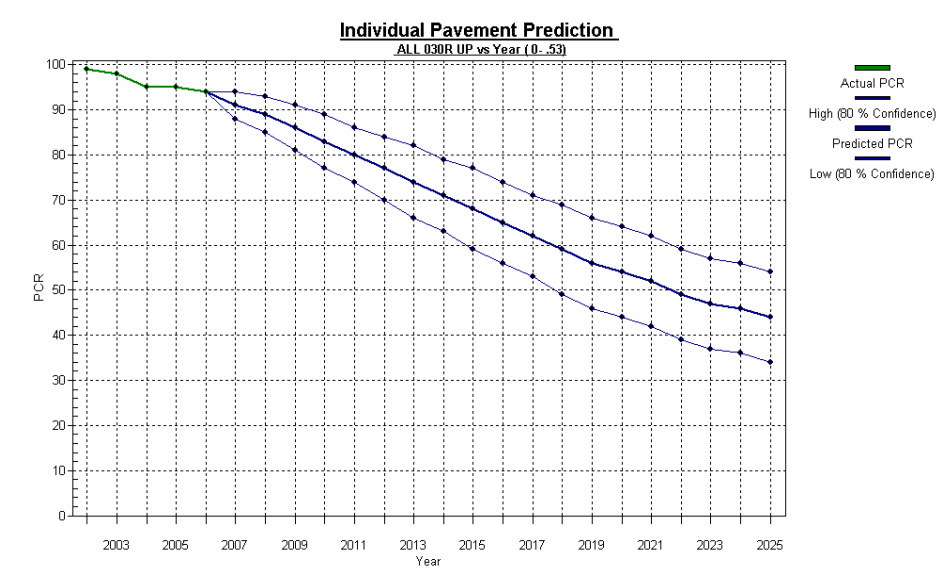


Figure 7.13 PCR Prediction Confidence Limits

7.5.5 Selected Predictions

This tool has the same functionality as the Markov prediction tool, but is designed for more advanced users to select pavement families for transition matrices.

7.6 SHOW PREDICTED PAVEMENT CONDITIONS

This tool can be used to view the Markov predicted pavement conditions. Figure 7.14 shows the user interface to view the predicted conditions.

Source Table: DATA_Transition Matrix,
DATA_PredictedPCR_JRC, DATA_PredictedDistress_JRC,
DATA_PredictedPCR_CRC, DATA_PredictedDistress_CRC,
DATA_PredictedPCR_Flex, DATA_PredictedDistress_Flex,
DATA_PredictedPCR_Comp, DATA_PredictedDistress_Comp, and
DATA_FutureProjects

Output Table: The default name for the output table is "PavementCondition_WithPlan." Users can update this table name by changing the text in the "Output Table name" text box.

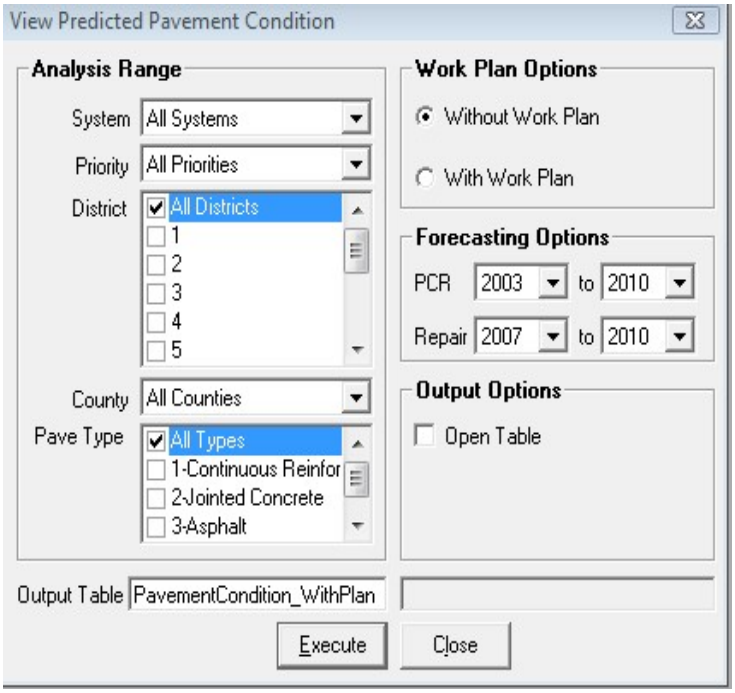


Figure 7.14 View Predicted Pavement Condition

Work Plan Options

Without Work Plan: Analysis based on original PCR and distress predictions
With Work Plan: Analysis based on result from overlay of PCR and distress predictions with DATA_FutureProjects file

Output Options

Start Year: Start year of the analysis
Forecast Upto: End year of the analysis

Example 1:

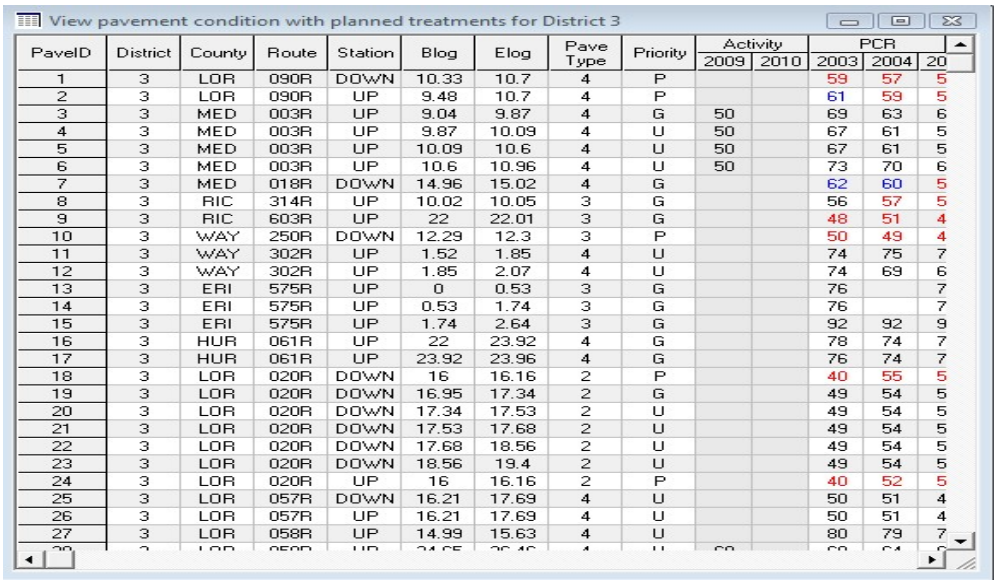
To view pavement conditions with the plan for District 3, select the following options:

1. "3" under "District"
2. "With Work Plan" under "Work Plan Options"

3. "2001" under "Start Year"
4. "2010" under "Forecast Upto

Enter an output table name in the "Output Table Name" text box and click "Execute."

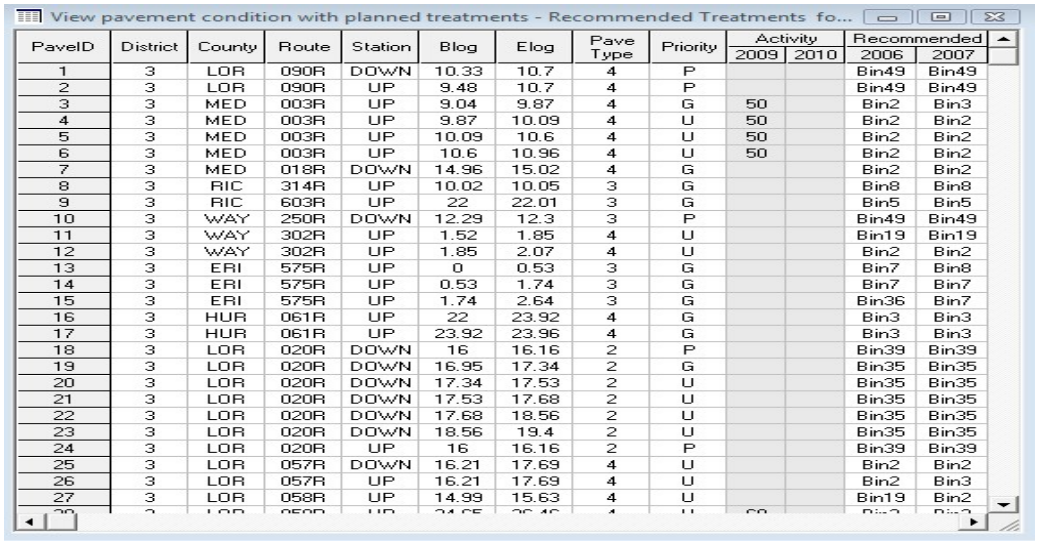
This procedure generates two grids: (1) "view pavement condition with planned treatments," which displays the predicted PCR overlaid with planned treatments and (2) "view pavement condition with planned treatments – recommended treatments," which displays the recommended treatments from the current year until 2010.


View pavement condition with planned treatments for District 3

PaveID	District	County	Route	Station	Blog	Elog	Pave Type	Priority	Activity		PCR		
									2009	2010	2003	2004	20
1	3	LOR	090R	DOWN	10.33	10.7	4	P			59	57	5
2	3	LOR	090R	UP	9.48	10.7	4	P			61	59	5
3	3	MED	003R	UP	9.04	9.87	4	G	50		69	63	6
4	3	MED	003R	UP	9.87	10.09	4	U	50		67	61	5
5	3	MED	003R	UP	10.09	10.6	4	U	50		67	61	5
6	3	MED	003R	UP	10.6	10.96	4	U	50		73	70	6
7	3	MED	018R	DOWN	14.96	15.02	4	G			62	60	5
8	3	RIC	314R	UP	10.02	10.05	3	G			56	57	5
9	3	RIC	603R	UP	22	22.01	3	G			48	51	4
10	3	WAY	250R	DOWN	12.29	12.3	3	P			50	49	4
11	3	WAY	302R	UP	1.52	1.85	4	U			74	75	7
12	3	WAY	302R	UP	1.85	2.07	4	U			74	69	6
13	3	ERI	575R	UP	0	0.53	3	G			76		7
14	3	ERI	575R	UP	0.53	1.74	3	G			76		7
15	3	ERI	575R	UP	1.74	2.64	3	G			92	92	9
16	3	HUR	061R	UP	22	23.92	4	G			78	74	7
17	3	HUR	061R	UP	23.92	23.96	4	G			76	74	7
18	3	LOR	020R	DOWN	16	16.16	2	P			40	55	5
19	3	LOR	020R	DOWN	16.95	17.34	2	G			49	54	5
20	3	LOR	020R	DOWN	17.34	17.53	2	U			49	54	5
21	3	LOR	020R	DOWN	17.53	17.68	2	U			49	54	5
22	3	LOR	020R	DOWN	17.68	18.56	2	U			49	54	5
23	3	LOR	020R	DOWN	18.56	19.4	2	U			49	54	5
24	3	LOR	020R	UP	16	16.16	2	P			40	52	5
25	3	LOR	057R	DOWN	16.21	17.69	4	U			50	51	4
26	3	LOR	057R	UP	16.21	17.69	4	U			50	51	4
27	3	LOR	058R	UP	14.99	15.63	4	U			80	79	7

Figure 7.15 View Pavement Condition with Planned Treatments

The second grid with recommended treatments is shown in Figure 7.16.


View pavement condition with planned treatments - Recommended Treatments fo...

PaveID	District	County	Route	Station	Blog	Elog	Pave Type	Priority	Activity		Recommended	
									2009	2010	2006	2007
1	3	LOR	090R	DOWN	10.33	10.7	4	P			Bin49	Bin49
2	3	LOR	090R	UP	9.48	10.7	4	P			Bin49	Bin49
3	3	MED	003R	UP	9.04	9.87	4	G	50		Bin2	Bin3
4	3	MED	003R	UP	9.87	10.09	4	U	50		Bin2	Bin2
5	3	MED	003R	UP	10.09	10.6	4	U	50		Bin2	Bin2
6	3	MED	003R	UP	10.6	10.96	4	U	50		Bin2	Bin2
7	3	MED	018R	DOWN	14.96	15.02	4	G			Bin2	Bin2
8	3	RIC	314R	UP	10.02	10.05	3	G			Bin8	Bin8
9	3	RIC	603R	UP	22	22.01	3	G			Bin5	Bin5
10	3	WAY	250R	DOWN	12.29	12.3	3	P			Bin49	Bin49
11	3	WAY	302R	UP	1.52	1.85	4	U			Bin19	Bin19
12	3	WAY	302R	UP	1.85	2.07	4	U			Bin2	Bin2
13	3	ERI	575R	UP	0	0.53	3	G			Bin7	Bin8
14	3	ERI	575R	UP	0.53	1.74	3	G			Bin7	Bin7
15	3	ERI	575R	UP	1.74	2.64	3	G			Bin36	Bin7
16	3	HUR	061R	UP	22	23.92	4	G			Bin3	Bin3
17	3	HUR	061R	UP	23.92	23.96	4	G			Bin3	Bin3
18	3	LOR	020R	DOWN	16	16.16	2	P			Bin39	Bin39
19	3	LOR	020R	DOWN	16.95	17.34	2	G			Bin35	Bin35
20	3	LOR	020R	DOWN	17.34	17.53	2	U			Bin35	Bin35
21	3	LOR	020R	DOWN	17.53	17.68	2	U			Bin35	Bin35
22	3	LOR	020R	DOWN	17.68	18.56	2	U			Bin35	Bin35
23	3	LOR	020R	DOWN	18.56	19.4	2	U			Bin35	Bin35
24	3	LOR	020R	UP	16	16.16	2	P			Bin39	Bin39
25	3	LOR	057R	DOWN	16.21	17.69	4	U			Bin2	Bin2
26	3	LOR	057R	UP	16.21	17.69	4	U			Bin2	Bin3
27	3	LOR	058R	UP	14.99	15.63	4	U			Bin19	Bin2

Figure 7.16 View Pavement Condition with Planned Treatments – Recommended Treatments

Users can right click the above grid and select “Generate Cost Summary” to generate a “Cost Summary” chart as shown in Figure 7.18.

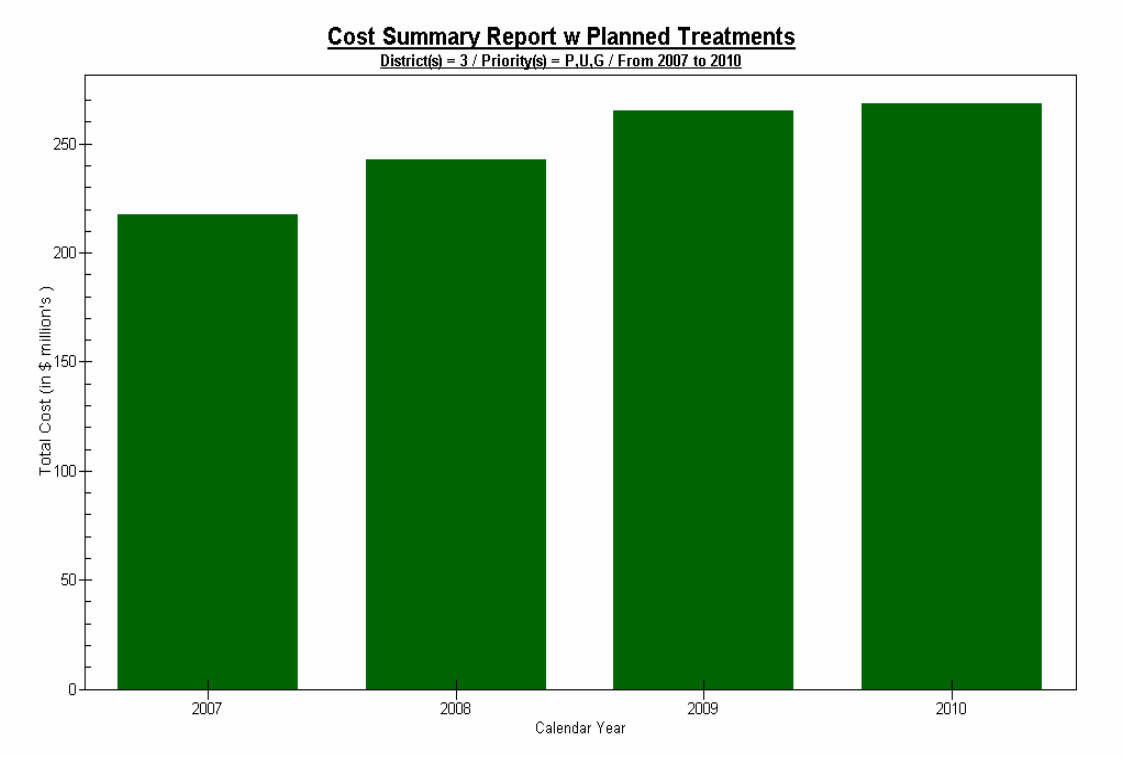


Figure 7.18 Cost Summary

7.7 ESTIMATE REMAINING LIFE

This tool can be used to estimate the remaining life of pavement sections based on certain PCR and/or distress thresholds. Figure 7.19 shows the user interface to view the predicted conditions.

Source Table: DATA_PredictedPCR_JRC, DATA_PredictedDistress_JRC, DATA_PredictedPCR_CRC, DATA_PredictedDistress_CRC, DATA_PredictedPCR_Flex, DATA_PredictedDistress_Flex, DATA_PredictedPCR_Comp, DATA_PredictedDistress_Comp.

Output Table: The default name for the output table is "Remaining Life." Users can update this table name by changing the text in the "Output Table name" text box.

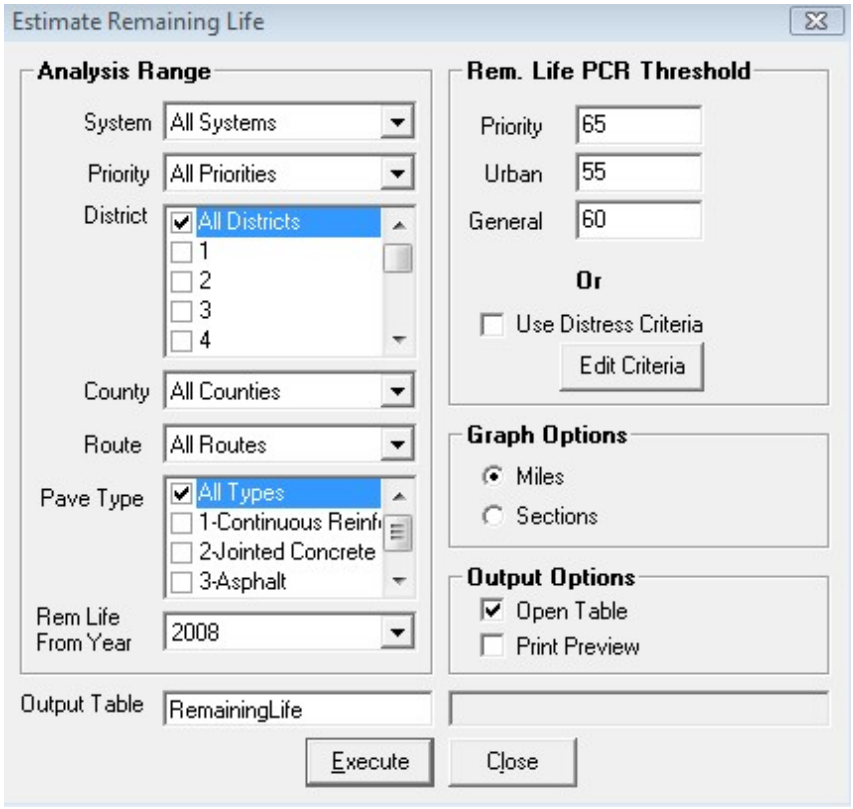


Figure 7.19 Estimate Remaining Life

Rem. Life PCR Threshold

Enter PCR thresholds in the text boxes. The remaining life is calculated by the time until the current PCR reaches the specified PCR threshold.

Use Distress Criteria

Check this option and click "Edit Criteria" to display the window shown in Figure 7.20. Users can then enter thresholds for individual distresses. The remaining life is calculated using both the PCR and distress thresholds, whichever occurs first.

Graph Options

Miles: Analysis will be based on the directional miles
Sections: Analysis will be based on the number of pavement sections

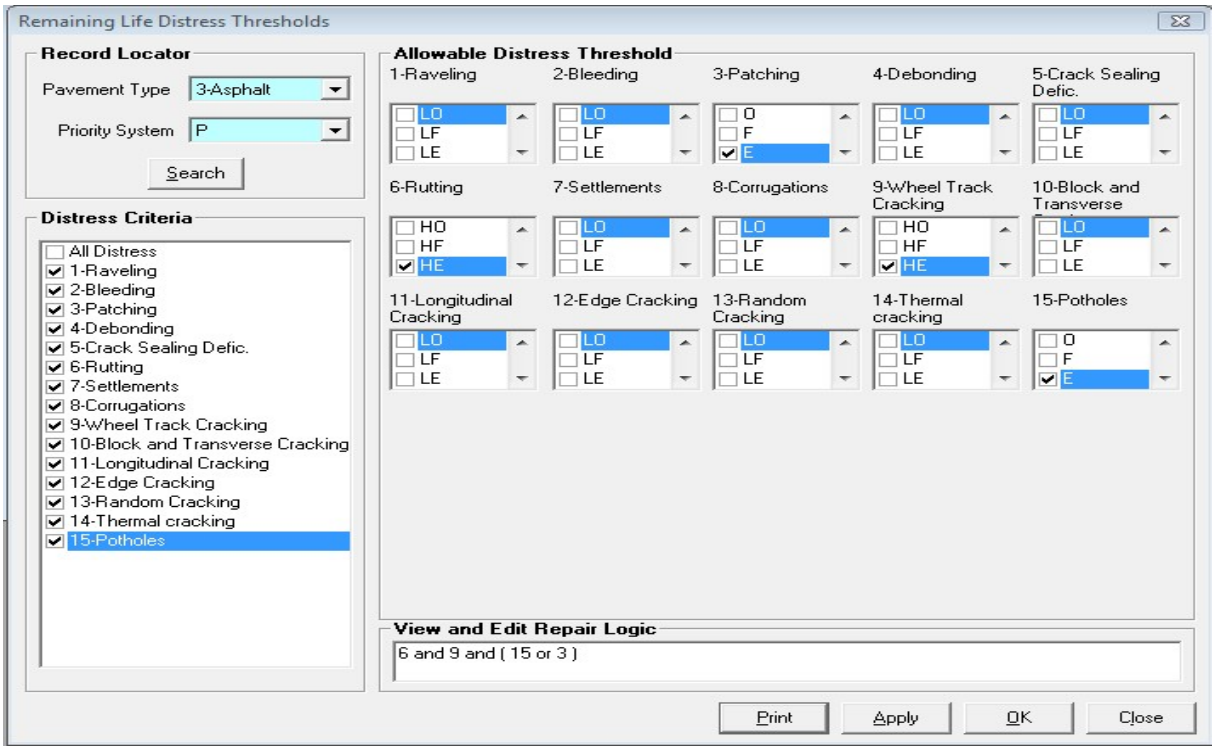


Figure 7.20 Distress Thresholds

Example 1:

To view the remaining life for "General System Pavements" from 2007 based on a PCR threshold of 55, select the following options:

1. "G" under "Priority"
2. "2008" under "Rem Life From Year"
3. "55" in the "General" text box under "Rem. Life PCR Threshold"

Enter an output table name in the "Output Table Name" text box and click "Execute."

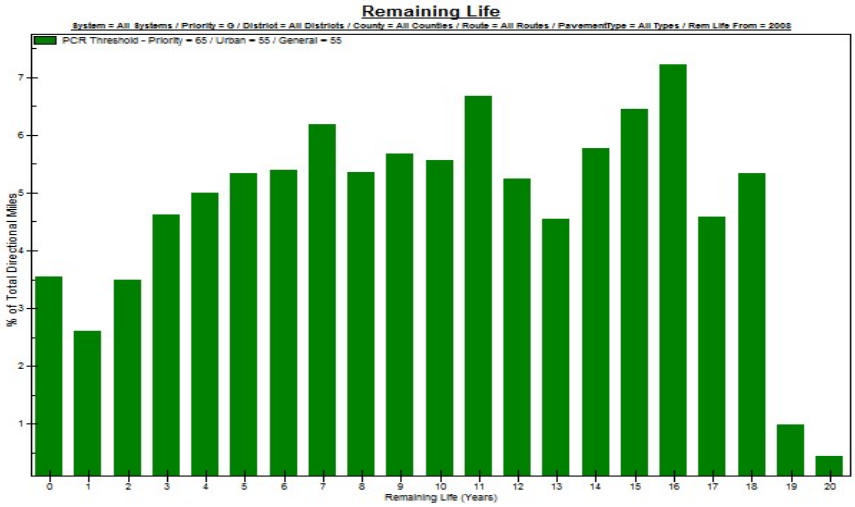


Figure 7.21 Remaining Life on General Systems

7.8 HISTOGRAM

This tool is used to generate a histogram for a selected field in a table.

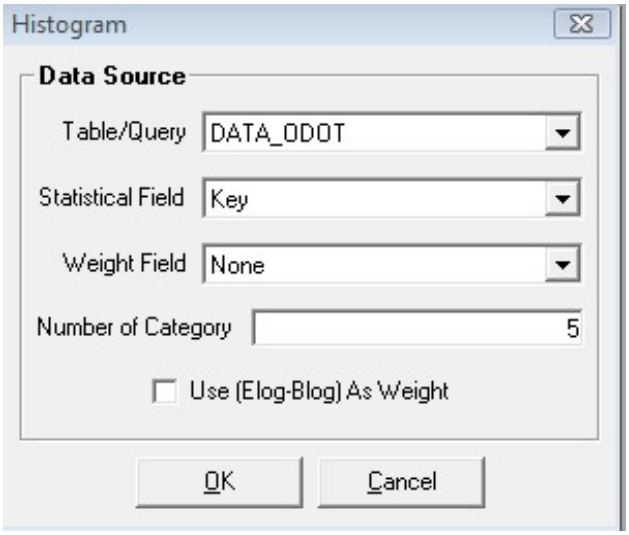


Figure 7.22 Histogram Tool

Data Source

Table/Query: Table or query from which a field is selected to generate histogram
Statistical Field: Field from the selected table
Weight field: sum of selected field in each category of statistical field
Number of Category: Number of categories for histogram
Use (Elog-Blog): Total mileage under each category.

Example 1:

Figure 7.23 shows the histogram for PCR, weighted by mileage from DATA_ODOT. This is generated by selecting "DATA_ODOT" in "Table/Query," "PCR" in "Statistical Field," "None" in "Weight Field," "5" in "Number of Category," and enabling "Use (Elog-Blog) As Weight."

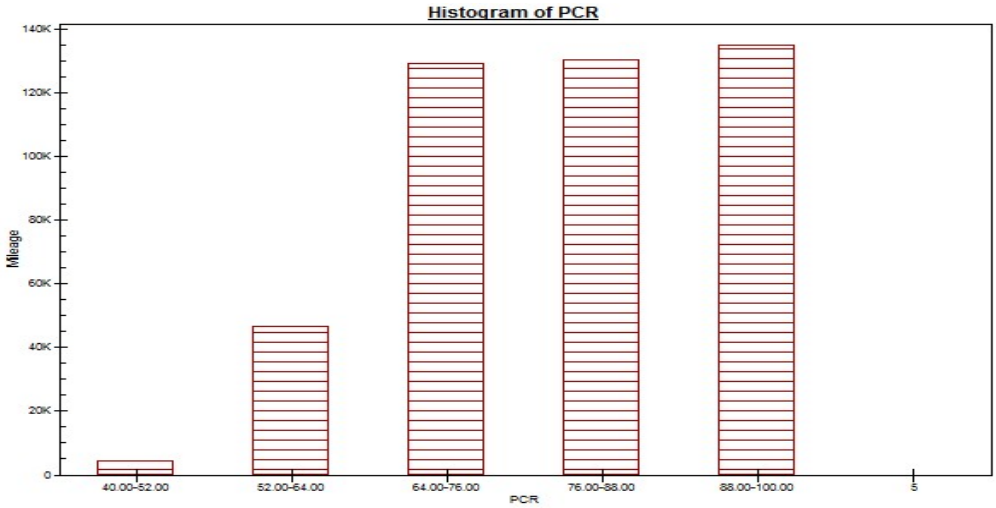


Figure 7.23 Example of a PCR Histogram Tool

SECTION 8 - REPORT MENU

This menu contains tools to generate reports of the database.

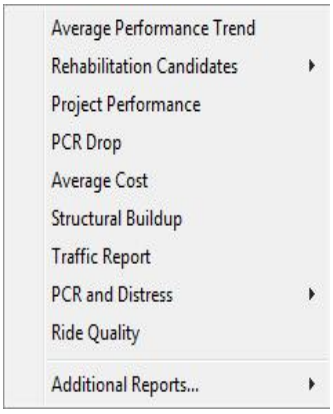


Figure 8.1 ODOTPMIS Report Menu

8.1 AVERAGE PERFORMANCE TREND

This tool generates an average performance report for parameters from DATA_ODOT.

Source Table: DATA_PERF_ANALYSIS, DATA_ODOT
Intermediate Table Generated: DATA_PERF_CURVE
Output Table: The default name for the output table is "Average Deterioration Trend Analysis." Users can update this table name by changing the text in the "Output Table name" text box.

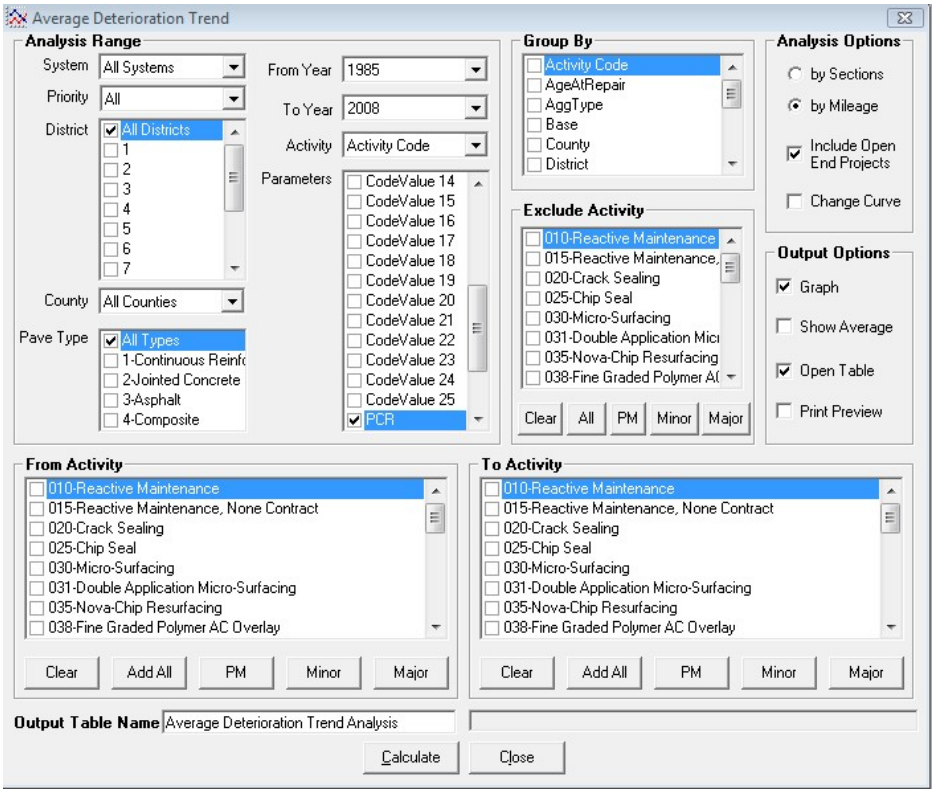


Figure 8.2 Average Deterioration Trend User Interface

Analysis Options

Include Open End Projects: Enabling this option will include open-ended projects (projects/pavements which still exist)

Change Curve: Enabling this option will generate a graph based on the rate of deterioration.

Output Options

Show Average: Enabling this option calculates and displays an average category based on the current categories displayed on the chart. For example, if the average deteriorations of Districts 1 and 3 are displayed, checking this option will display an additional category that is the average of deterioration trends on Districts 1 and 3.

Example:

The following example shows the average deterioration trend report for PCR and RN for all systems, priorities, pavement types and counties in district 1 for Activity codes 50 and 60 and from 1985 to 2006. Select following options on the tool:

1. "All Systems" under "System"
2. "All" under "Priority"
3. "1" under "District"
4. "All Counties" under "County"

5. "All Types" under "Pave Type"
6. "All Directions" under "System"
7. "1985" under "From Year," and "2006" under "To Year"
8. "Activity Code" under "Activity" list
9. "PCR" and "RN" under "Parameters"
10. "50" and "60" under "From Activity" list, and "Add All" under "To Activity" list

Enter an output table name in the "Output Table Name" text box and click "Execute."

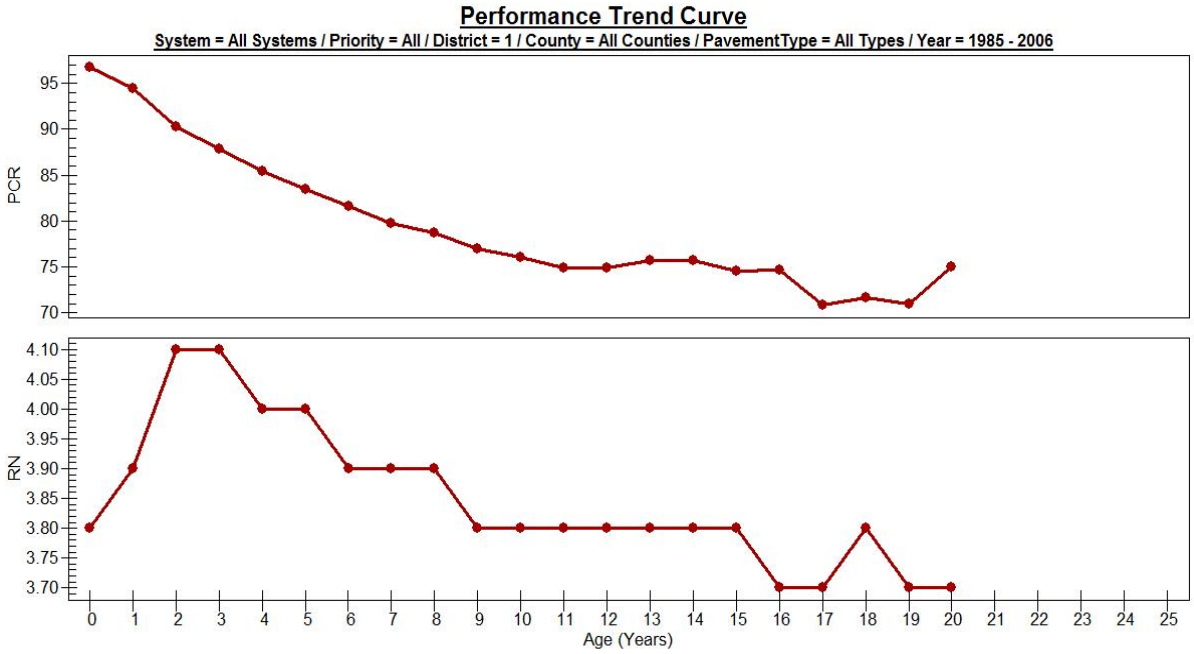


Figure 8.3 Performance Trend Curve

This tool also generates a mileage chart as shown in Figure 8.4.

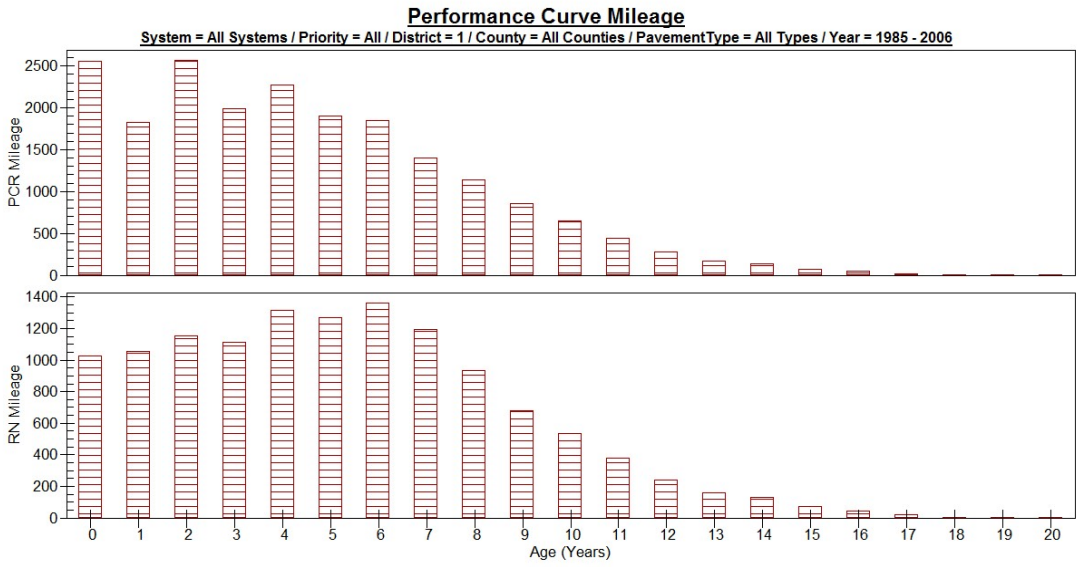


Figure 8.5 is generated when the "Change Curve" option is checked in "Analysis Options" and shows the change curve for "PCR" and "RN." The change curve values are obtained by taking the difference of two consecutive average deterioration values. It represents the rate of deterioration.

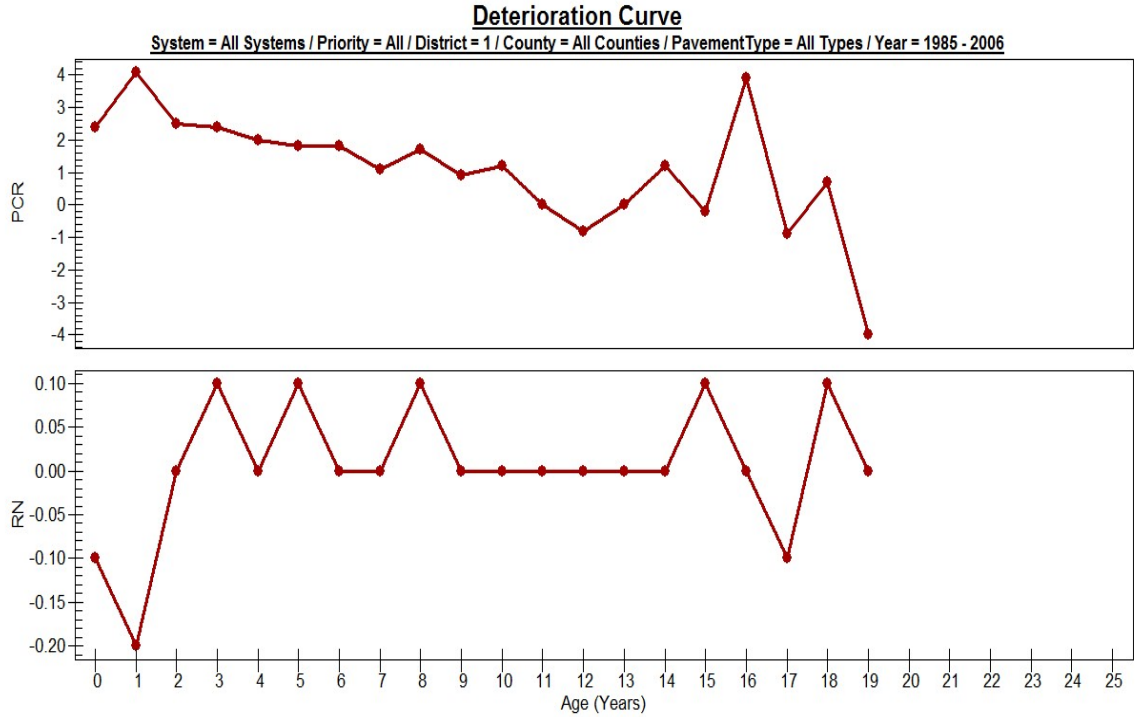


Figure 8.5 Change Curve

8.2 REHABILITATION CANDIDATES

This menu is used to generate a rehabilitation candidate list based on the treatment decision trees provided by ODOT. The tools available under this menu are "Generate Statewide Rehab List," "Generate U/G Rehab List," "Generate Priority Rehab List," "Priority System Major Rehab List," and "Modify Repair Logic." For all the tools under this menu, the following tables are used in the background:

Source Tables: DATA_ODOT, DATA_Project History_Apparent, DATA_PERF_BASE, LU_Repair Logic, LU_Repair Limits

8.2.1 Generate Statewide Rehab List

This tool generates the recommended treatments for all the pavement sections in the database for the latest available PCR. The user interface is shown in Figure 8.6. The output is stored in the table name given in the "Output Table" text box. In addition to this output table, this tool also generates a bin summary table that contains the directional

miles that fall under each bin category. If the output table name is [table name], the bin summary table created will be named
[table name_Bin Summary].

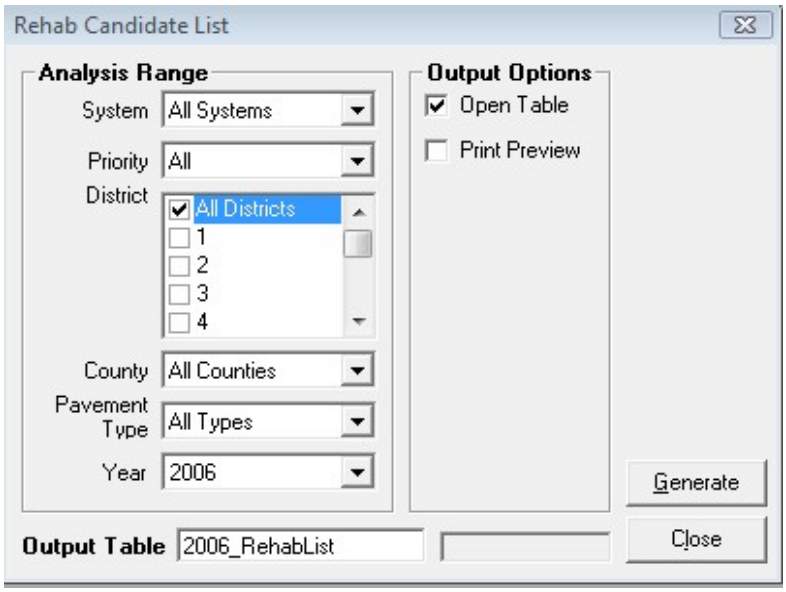


Figure 8.6 Rehab Candidates

8.2.2 General U/G Rehab List

This tool generates the recommended treatments (bin's) list only for pavement sections on urban and general systems. The user interface is similar to above in Figure 8.6, however, in the "Priority" combo box, the default value is "U/G."

8.2.3 General Priority Rehab List

This tool generates the recommended treatments (bin's) list only for pavement sections on urban and general systems. The user interface is similar to Figure 8.6, however the "Priority" combo box is defaulted to "P."

8.2.4 Priority System Major Rehab List

This tool generates the candidate sections eligible for major rehab on priority systems based on the decision tree provided by ODOT. The user interface is shown in Figure 8.7. The decision tree and repair logic are also shown in the user interface.

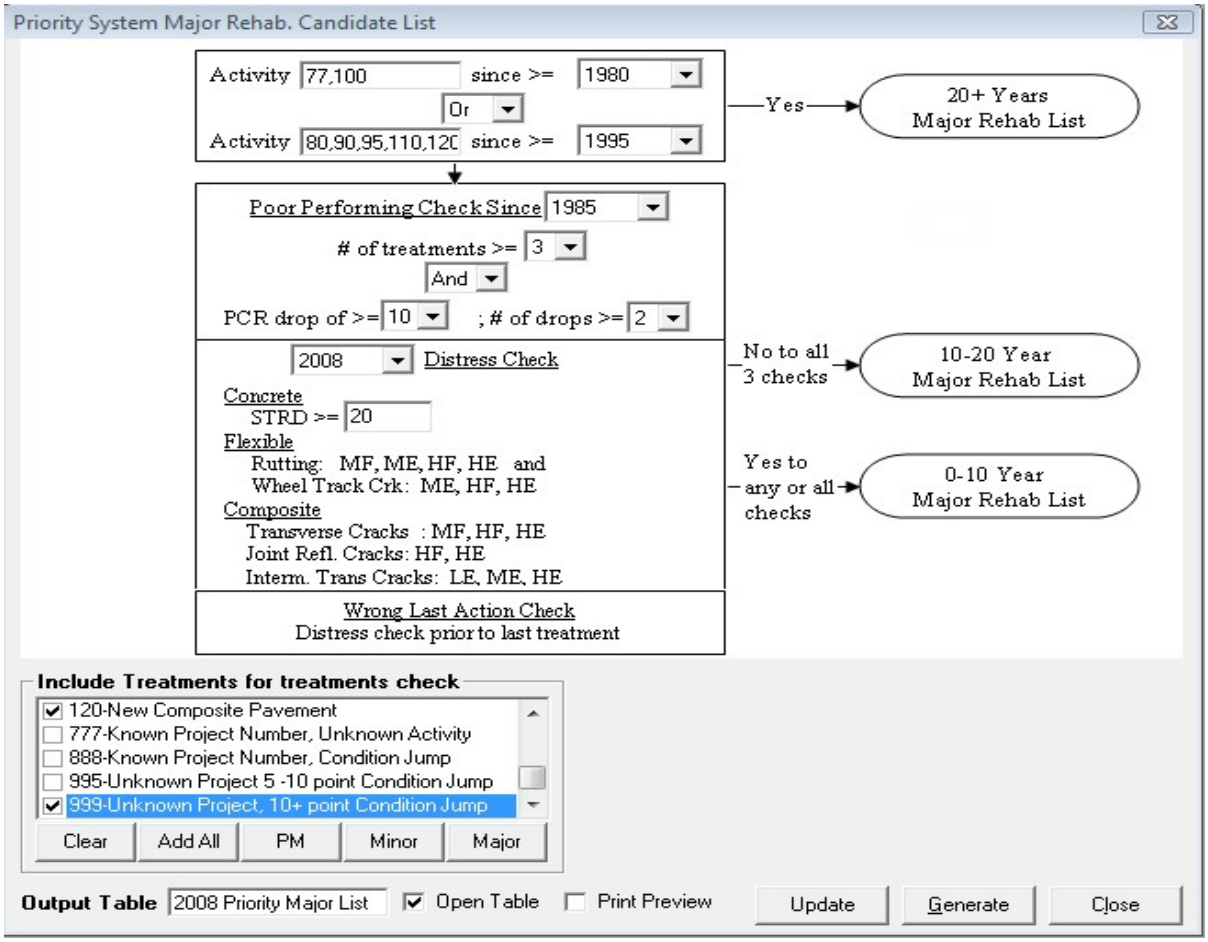


Figure 8.7 Priority System Major Rehab List

Include Treatments for Treatments Check

This option allows the user to select the treatments that will be included in the "# of treatments" check in the decision tree.

Merge Continuous Sections Options

These options allow the user to control how continuous sections are merged. The options provided are

Default: Two continuous sections are merged into a single record by considering the "Minimum PCR," "Maximum Total ADT," and "Truck ADT" between the sections, provided the remaining fields are equal

All Equal: Two continuous sections are merged into a single record if all the fields are equal

All Min: Two continuous sections are merged into a single record by considering the "Minimum of PCR," "Total ADT," and "Truck ADT" between the sections provided the remaining fields are equal

All Max: Two continuous sections are merged into a single record by considering the "Maximum of PCR," "Total ADT," and "Truck ADT" between the sections provided the remaining fields are equal

All Avg: Two continuous sections are merged into a single record by considering the "Average of PCR," "Total ADT," and "Truck ADT" between the sections provided the remaining fields are equal

8.2.5 Modify Rehab Logic

This tool enables the user to change the decision tree and repair logic provided by ODOT. Figure 8.8 shows the interface for modifying decision trees.

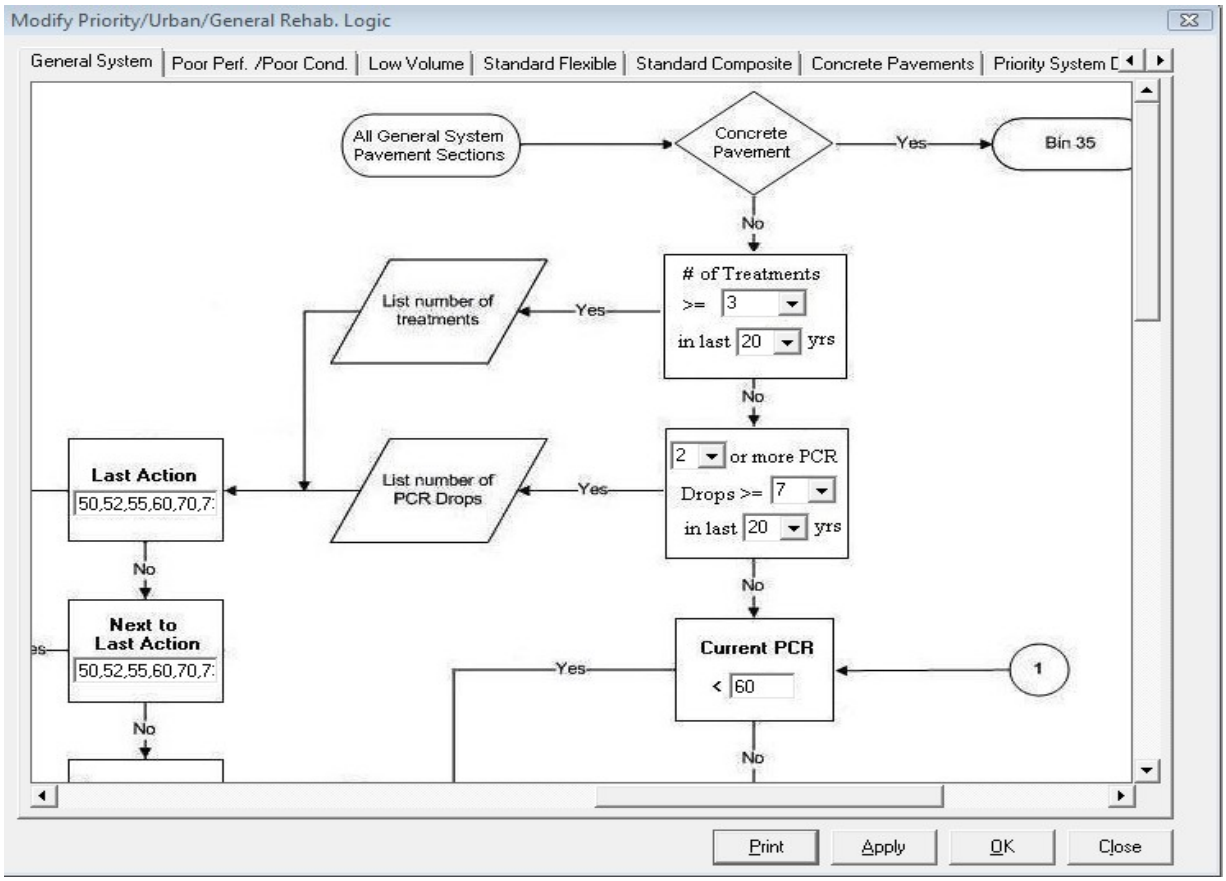


Figure 8.8 Modify Decision Trees and Repair Logic

To modify a decision tree, choose the category by clicking on the appropriate tab in the "Modify Priority/Urban/General Rehab Logic" sub-window. Text boxes are provided at various stages (for PCR, traffic, etc.). Enter new values in the text boxes and click "Apply" to modify the decision tree.

To modify the repair logic ("Preventive Maintenance," "Major," "Minor," and "Priority Major Rehab"), click "Miscellaneous Criteria." Select the "Pavement Type," "Preservation," and "Priority System" in the "Record Locator" and click "Search." The

"Miscellaneous Criteria" tab provides options to change the "Functional Class," "PCR Limits," and "Traffic" as shown in Figure 8.9. This is the basic procedure:

Note: If the value for criteria is empty, it is not considered in the repair logic.

1. Change the "Functional Class" in the "Functional Class" list
2. Change the "PCR Limits" in the "PCR Lower Limit" and "PCR Upper Limit" text boxes
3. Change the "Traffic Limits" in the "Total ADT" and "Truck ADT" text boxes
4. Change the "Cracking Index Limit" in the "Max Cracking Index" text box
5. For two lanes, apply the "Two-Lane Only" option
6. Select appropriate distress levels for each code under "Allowable Distress"
7. Click "Apply" to save the changes

To change the logic for a repair check i.e., to include or remove any distress from the repair logic, use the "View and Edit Repair Logic" text box.

Figure 8.9 shows the allowable distress for a structural check of a general system, flexible pavement. The repair logic is "6 and 9 and (15 or 3)". The user can edit the text in this text box to add or remove any distress, however, the default syntax must be used to make any changes. This syntax is shown in Figure 8.9.

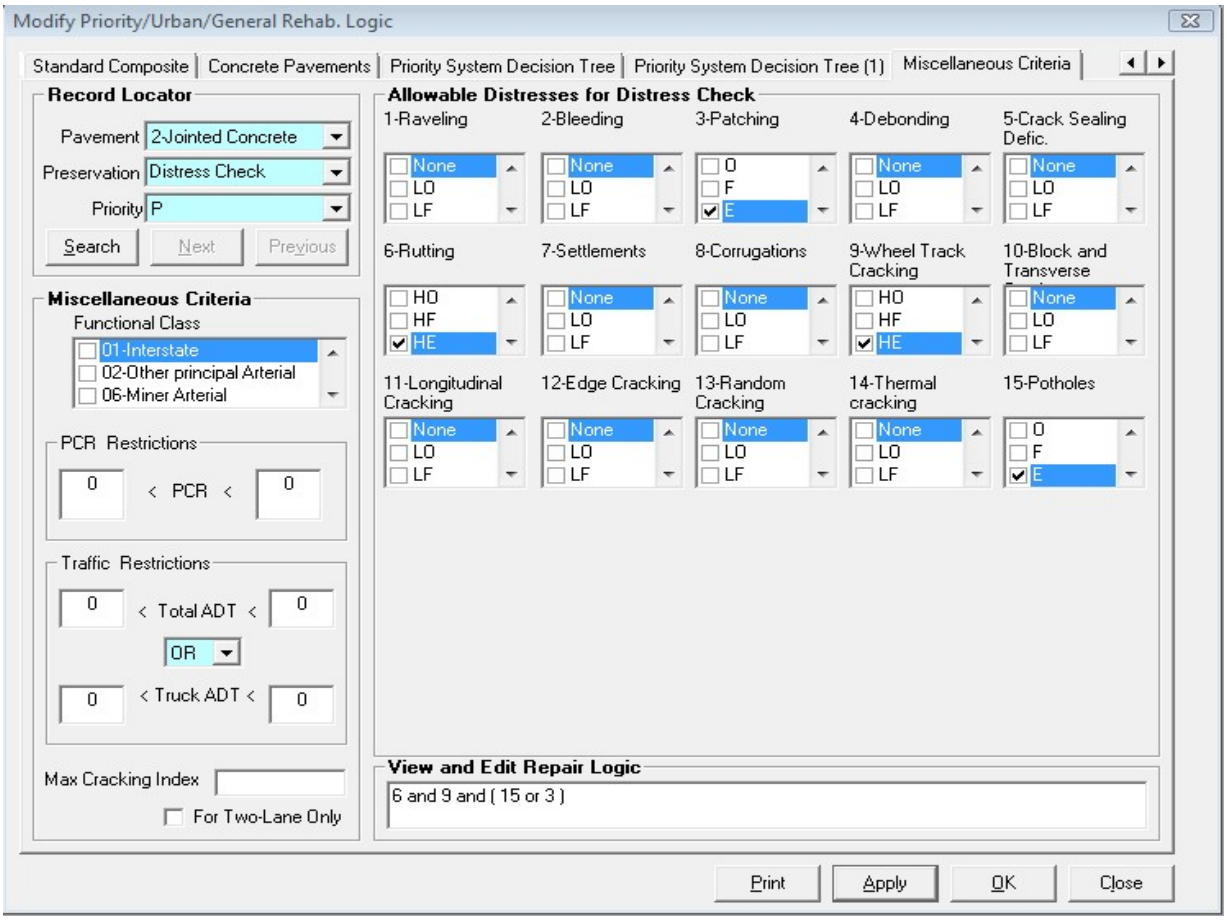


Figure 8.9 Edit Repair Logic

Syntax for Editing Repair Logic

1. Enter any distresses by their code numbers
   Example: If the logic is "Rutting" or "Wheel Track Cracking" for flexible pavement, the user should input "6 or 9"

2. Separate text by spaces
   Example: The correct syntax for the command "1or2or3" is "1 or 2 or 3"

3. Separate brackets by spaces
   Example: The correct syntax for the text "1or(2and3)or4" is "1 or (2 and 3) or 4"

8.3 PROJECT PERFORMANCE

In the "Report" menu, click "Project Performance." This tool generates the project performance reports.

Source Table: DATA_Project History_Apparent, DATA_ODOT

Output Table: The default name for the output table is "Project Performance." Users can update this table name by changing the text in the "Output Table name" text box.

Figure 8.10 shows the window used for generating this report. The "Analysis Range" frame selects the project number and parameters to be used to generate the report.

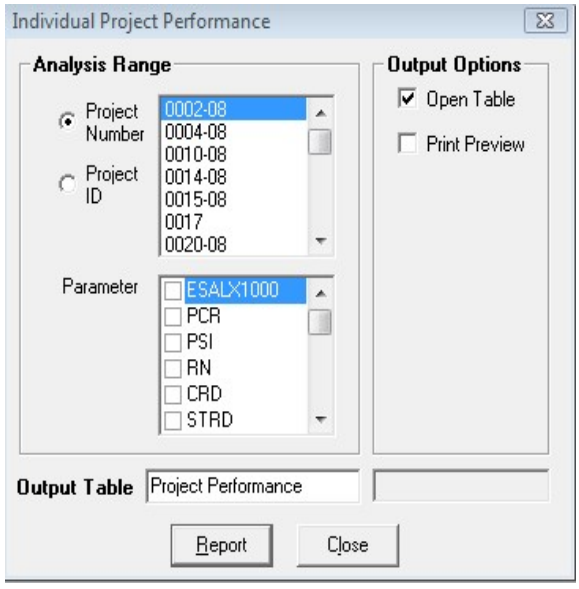
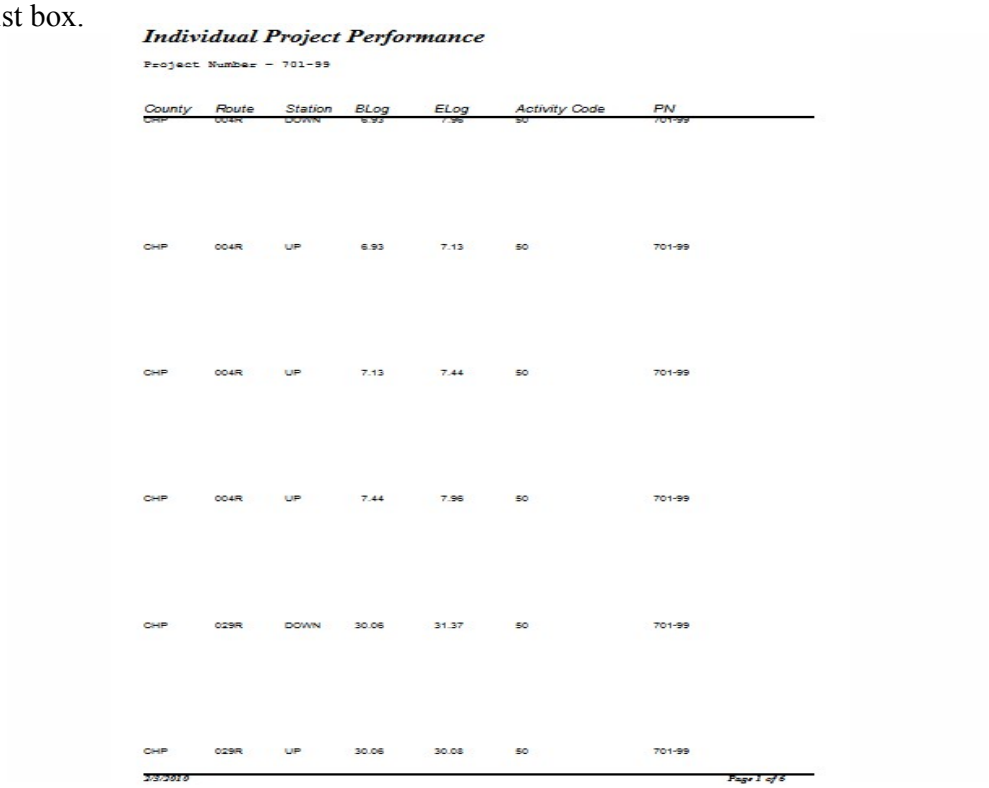


Figure 8.10 Individual Project Performance

Example:

Figure 8.11 shows the Project Performance Report for Project Number 701-99 for PCR and RN (Ride Number). This report is generated by selecting "Project Number

701-99" in the "Project Number" list box, and "PCR" and "RN" in the "Parameter" list box.



Individual Project Performance

Project Number = 701-99

County	Route	Station	BLog	ELog	Activity Code	PN
CHP	004R	DOWN	6.93	7.96	50	701-99
CHP	004R	UP	6.93	7.13	50	701-99
CHP	004R	UP	7.13	7.44	50	701-99
CHP	004R	UP	7.44	7.96	50	701-99
CHP	029R	DOWN	30.06	31.37	50	701-99
CHP	029R	UP	30.06	30.08	50	701-99

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Figure 8.11 Example of Individual Project Performance Output

8.4 PCR DROP

This tool generates a list of pavement sections with a quantity of PCR drops greater than or equal to a specified value, and with specific treatments performed. PCR Drop for this tool is defined as decrease in PCR value between any two years.

Source Table: DATA_Project History_Apparent, DATA_ODOT, DATA_PERF_BASE
Output Table: The default name for the output table is "PCR Drop List." Users can update this table name by changing the text in the "Output Table name" text box.

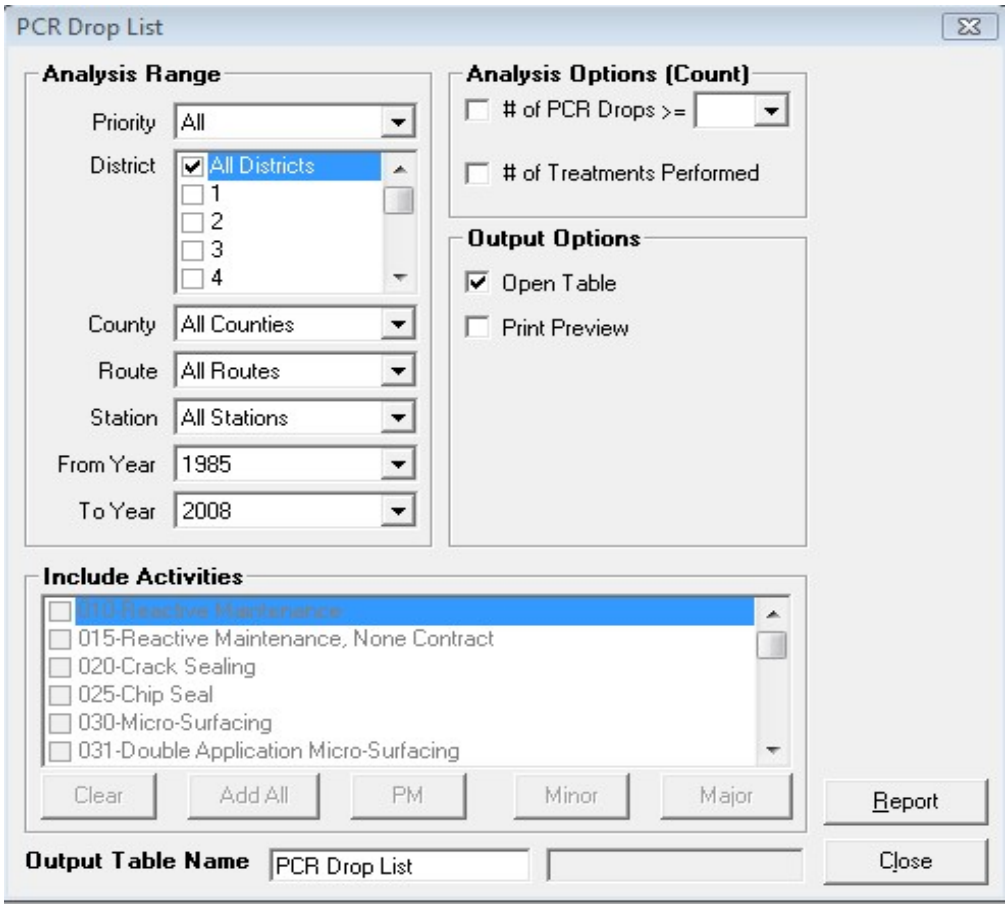


Figure 8.12 PCR Drop Tool

Analysis Options

PCR Drop >=: When checked, this option will calculate the number of PCR Drops greater than or equal to the value selected in the drop down box and between the values selected in the "From Year" and "To Year" drop down boxes

 # Of Treatments Performed: When checked, this option will calculate the number of treatments performed between the values selected in the "From Year" and "To Year" drop down boxes. The treatments selected in "Include Activities" will be counted

8.5 AVERAGE COST`

This tool generates an average cost report for each activity. To generate this report, the look up table LU_COST must exist in the database. In the "Data" menu, click "Generate Cost Lookup Table" to generate LU_COST.

Source Table: DATA_Project History, LU_COST
Output Table: The default name for the output table is "Unit Cost Analysis." Users can update this table name by changing the text in the "Output Table name" text box.

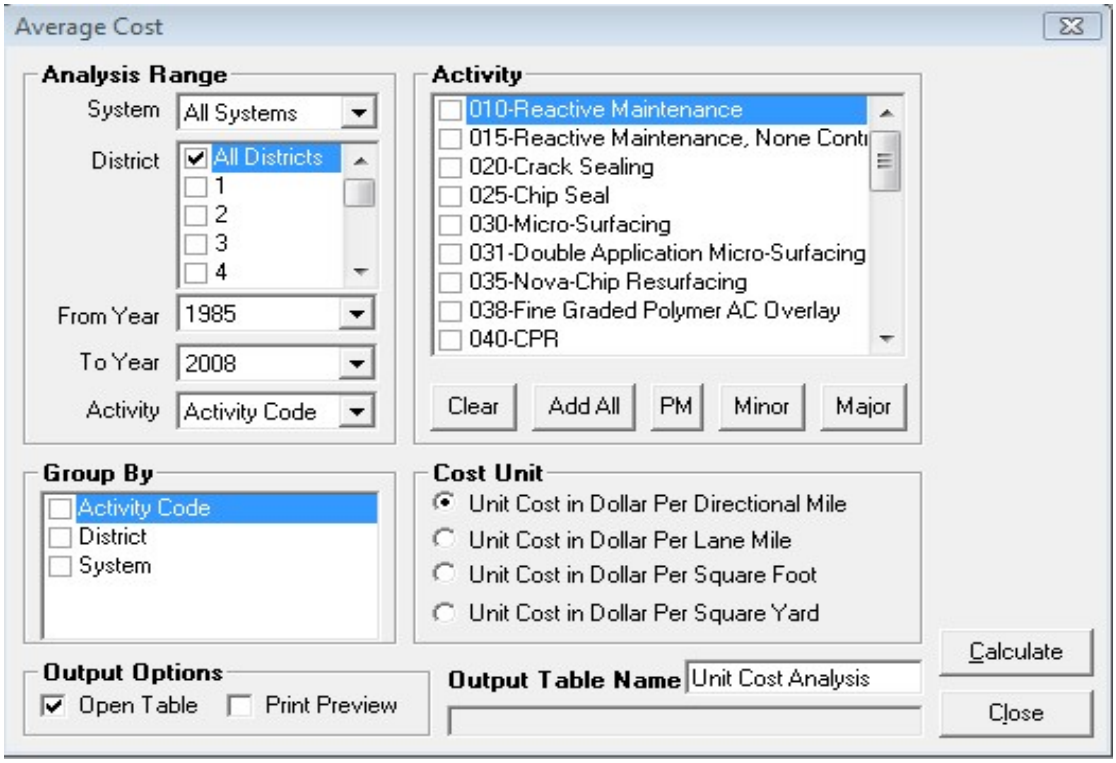
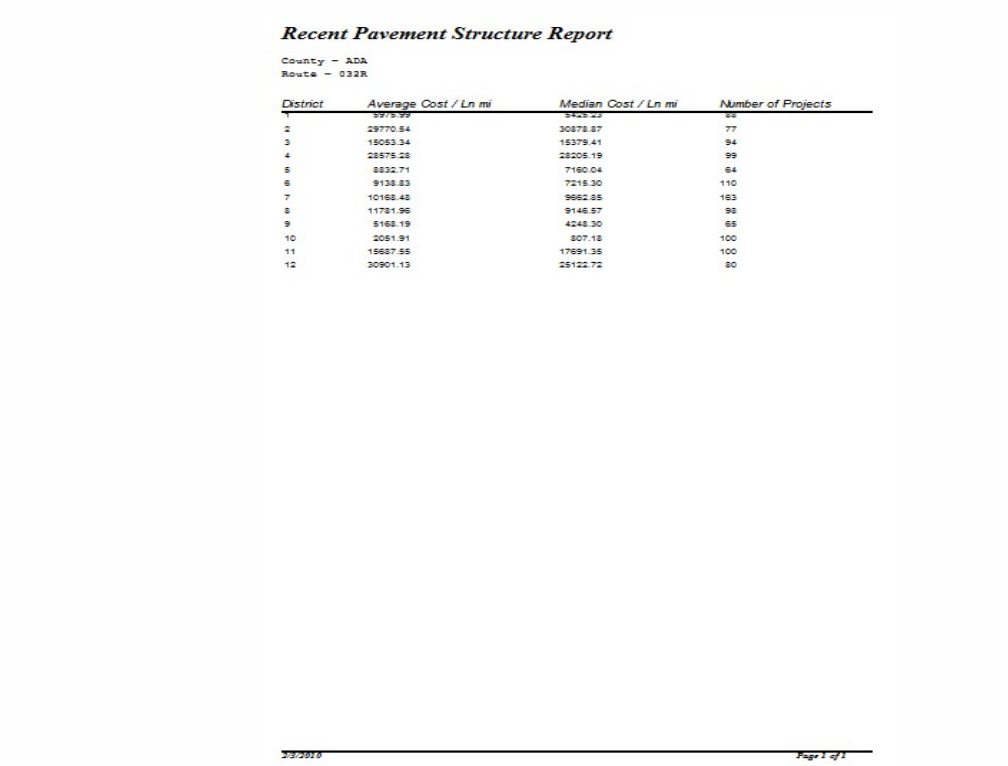


Figure 8.13 Average Cost Analysis Interface User Interface

Example:

Figure 8.14 shows the cost report for Activities 50 and 60 per lane mile, for all systems and in each district from 1985 to 2006.

This report is generated by selecting "All Systems" under "System," "All" under "District," "1985" under "From Year," "2006" under "To Year," "Activity Code" under "Activity," "District" under "Group By," "50" and "60" under "Activity," and "Unit Cost in Dollar Per Lane Mile" under "Cost Unit."



Recent Pavement Structure Report

County – ADA
Route – 032R

District	Average Cost / Ln mi	Median Cost / Ln mi	Number of Projects
1	9975.99	9425.22	68
2	29770.54	30878.87	77
3	15053.34	15379.41	94
4	28575.28	28205.19	99
5	8832.71	7160.04	64
6	9138.83	7215.30	110
7	10168.48	9662.85	163
8	11781.96	9146.57	98
9	5168.19	4248.30	65
10	2051.91	807.18	100
11	15687.55	17691.35	100
12	30901.13	25122.72	80

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Figure 8.14 Average Cost Per Lane Mile for Overlays

8.6 STRUCTURAL BUILDUP

This tool generates a current pavement structure report.

Source Table: DATA_Project History, DATA_PERF_BASE
Output Table: The default name for the output table is "Recent Pavement Structure Report" Users can update this table name by changing the text in the "Output Table name" text box.

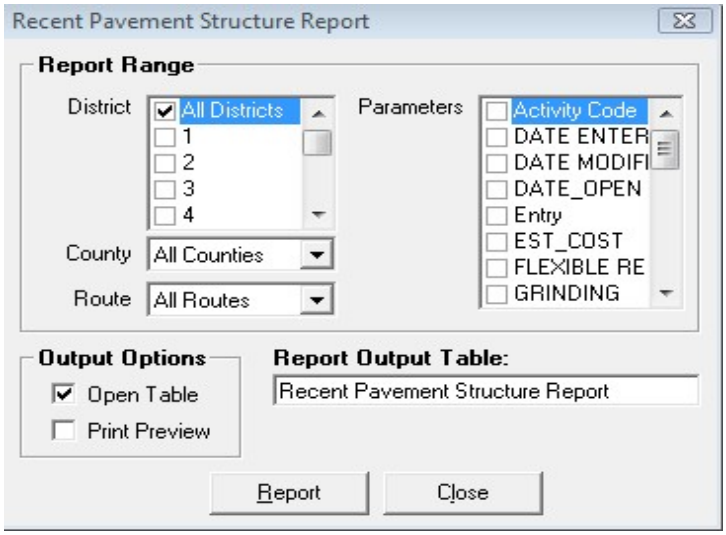
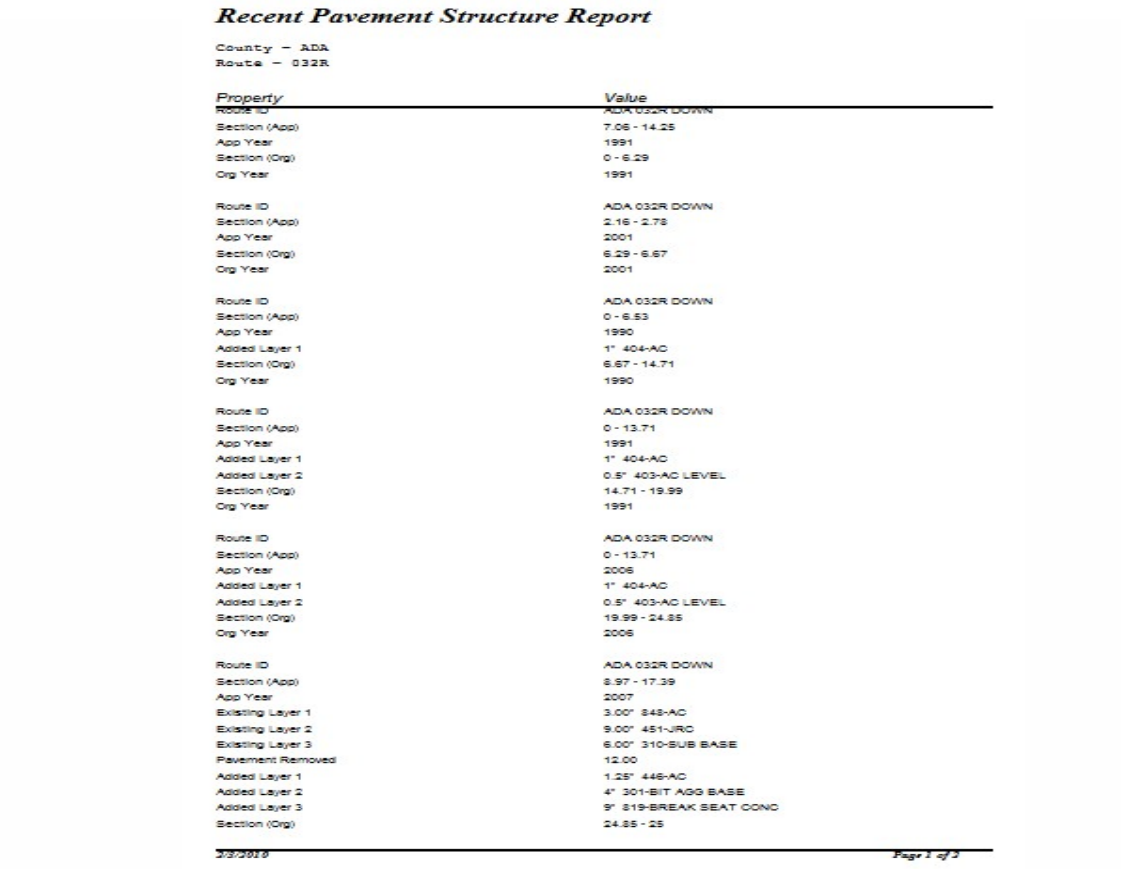


Figure 8.15 Pavement Structure Report

Example:

Figure 8.16 shows the current pavement structural buildup for Route 032R in Adams County. This report is generated by selecting "ADA" in the "County" list and 032R in the "Route" list.



Recent Pavement Structure Report

County = ADA
Route = 032R

Property	*Value*
Route ID	ADA 032R DOWN
Section (App)	7.06 - 14.25
App Year	1991
Section (Org)	0 - 6.29
Org Year	1991
Route ID	ADA 032R DOWN
Section (App)	2.16 - 2.78
App Year	2001
Section (Org)	6.29 - 6.67
Org Year	2001
Route ID	ADA 032R DOWN
Section (App)	0 - 6.53
App Year	1990
Added Layer 1	1" 404-AC
Section (Org)	6.67 - 14.71
Org Year	1990
Route ID	ADA 032R DOWN
Section (App)	0 - 13.71
App Year	1991
Added Layer 1	1" 404-AC
Added Layer 2	0.5" 403-AC LEVEL
Section (Org)	14.71 - 19.99
Org Year	1991
Route ID	ADA 032R DOWN
Section (App)	0 - 13.71
App Year	2006
Added Layer 1	1" 404-AC
Added Layer 2	0.5" 403-AC LEVEL
Section (Org)	19.99 - 24.85
Org Year	2006
Route ID	ADA 032R DOWN
Section (App)	8.97 - 17.39
App Year	2007
Existing Layer 1	3.00" 848-AC
Existing Layer 2	9.00" 451-JRC
Existing Layer 3	6.00" 310-SUB BASE
Pavement Removed	12.00
Added Layer 1	1.25" 446-AC
Added Layer 2	4" 301-BIT AGG BASE
Added Layer 3	9" 819-BREAK SEAT CONC
Section (Org)	24.85 - 25

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Figure 8.16 Recent Pavement Structure Report Output

8.7 TRAFFIC REPORT

This tool generates the average Traffic, ESAL, and summary statistics report.

Source Table: DATA_ODOT
Output Table: The default name for the output table is "Traffic Report" Users can update this table name by changing the text in the "Output Table name" text box.

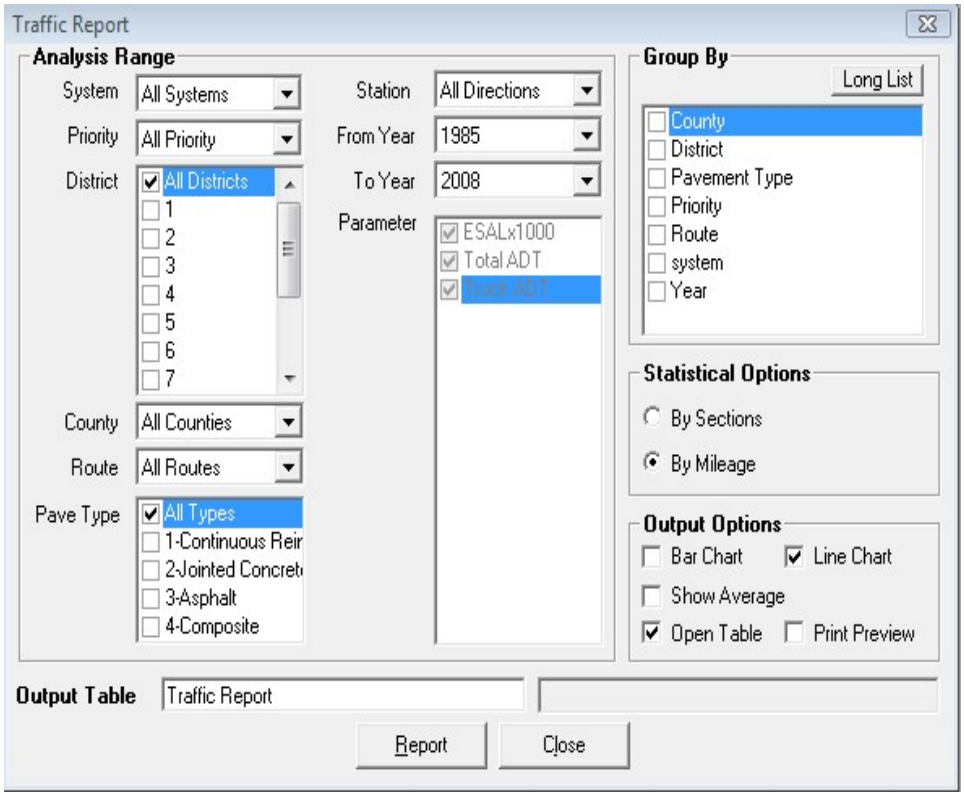


Figure 8.17 Traffic Report User Interface

Example:

Figure 8.18 shows the charts for ESALX1000, Total ADT, and Truck ADT for all systems, priorities, pavement types, and routes in District 1 from 1985 to 2006. The tool also generates a report, shown in Figure 8.19.

The charts and report are generated by selecting "All Systems" under "System," "All" under "Priority," "1" under "District," "All Counties" under "County," "All Types" under "Pave Type," "All Directions" under "System," "1985" under "From Year," "2006" under "To Year," "Year" under "Group By," "By Mileage" under "Analysis Options," "Line Chart" under "Output Options," and "Show Average" under "Output Options."

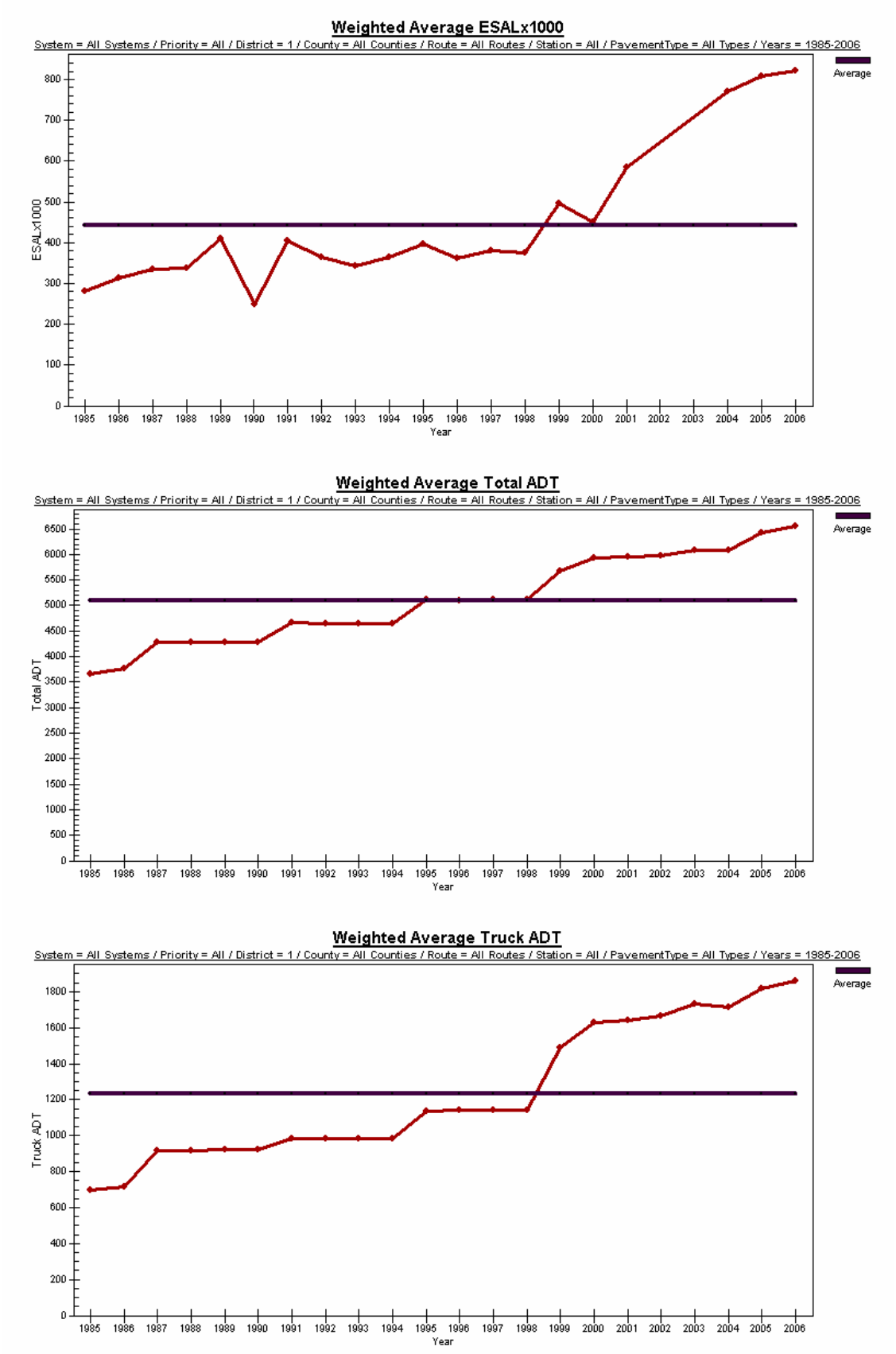
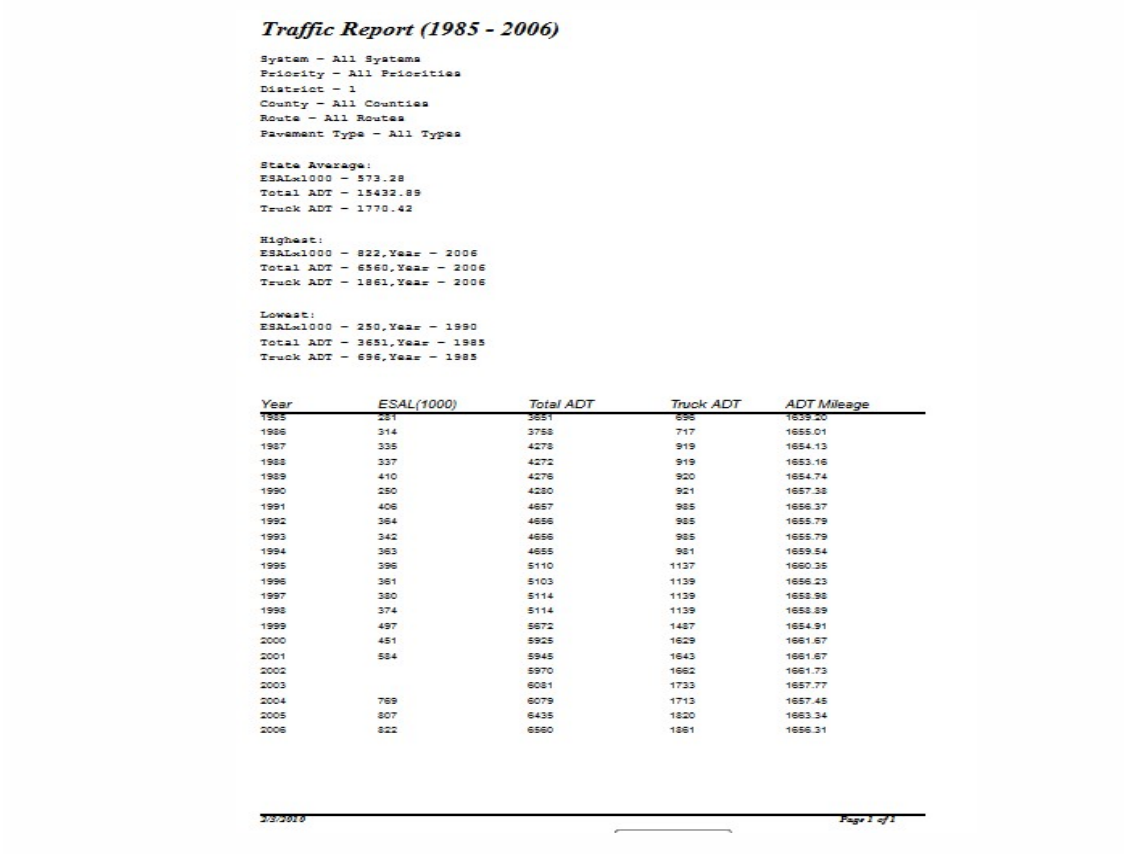


Figure 8.18 Traffic Report Charts



Traffic Report (1985 - 2006)

System – All Systems
Priority – All Priorities
District – 1
County – All Counties
Route – All Routes
Pavement Type – All Types

State Average:
ESALx1000 – 573.28
Total ADT – 15432.89
Truck ADT – 1770.42

Highest:
ESALx1000 – 822, Year – 2006
Total ADT – 6560, Year – 2006
Truck ADT – 1861, Year – 2006

Lowest:
ESALx1000 – 250, Year – 1990
Total ADT – 3651, Year – 1985
Truck ADT – 696, Year – 1985

Year	ESAL(1000)	Total ADT	Truck ADT	ADT Mileage
1985	251	3651	696	1639.20
1986	314	3758	717	1655.01
1987	335	4278	919	1654.13
1988	337	4272	919	1653.16
1989	410	4276	920	1654.74
1990	250	4280	921	1657.38
1991	406	4657	985	1656.37
1992	364	4656	985	1655.79
1993	342	4656	985	1655.79
1994	363	4655	981	1659.54
1995	396	5110	1137	1660.35
1996	361	5103	1139	1656.23
1997	380	5114	1139	1658.98
1998	374	5114	1139	1658.89
1999	497	5672	1487	1654.91
2000	451	5925	1629	1661.67
2001	584	5945	1643	1661.67
2002		5970	1662	1661.73
2003		6081	1733	1657.77
2004	769	6079	1713	1657.45
2005	807	6435	1820	1663.34
2006	822	6560	1861	1656.31

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Figure 8.19 Traffic Report

8.8 PCR AND DISTRESS

This menu is used to generate the average PCR and distress by project age or calendar year.

Source Tables: DATA_ODOT, DATA_PERF_ANALYSIS

8.8.1 Average by Project Age

This tool generates the average distresses, CRD (cracking deduct), PCR, and STRD (structural deduct) for a project year. The user interface is shown in Figure 8.20.

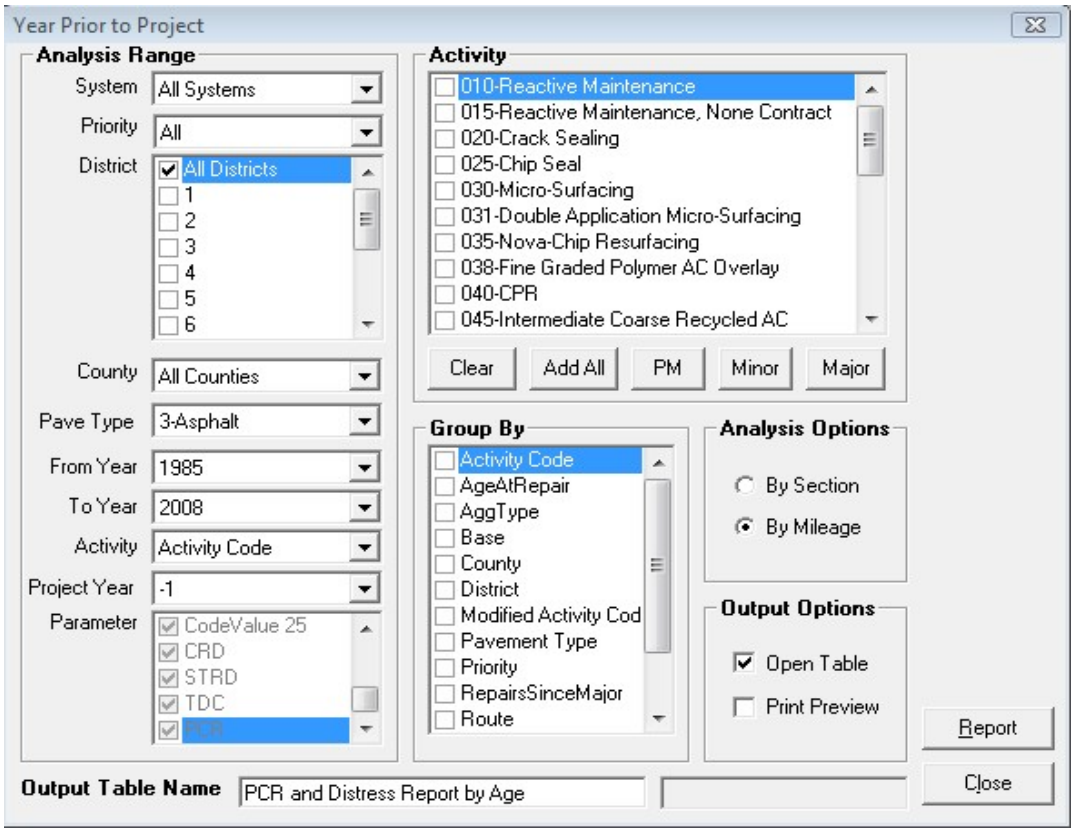
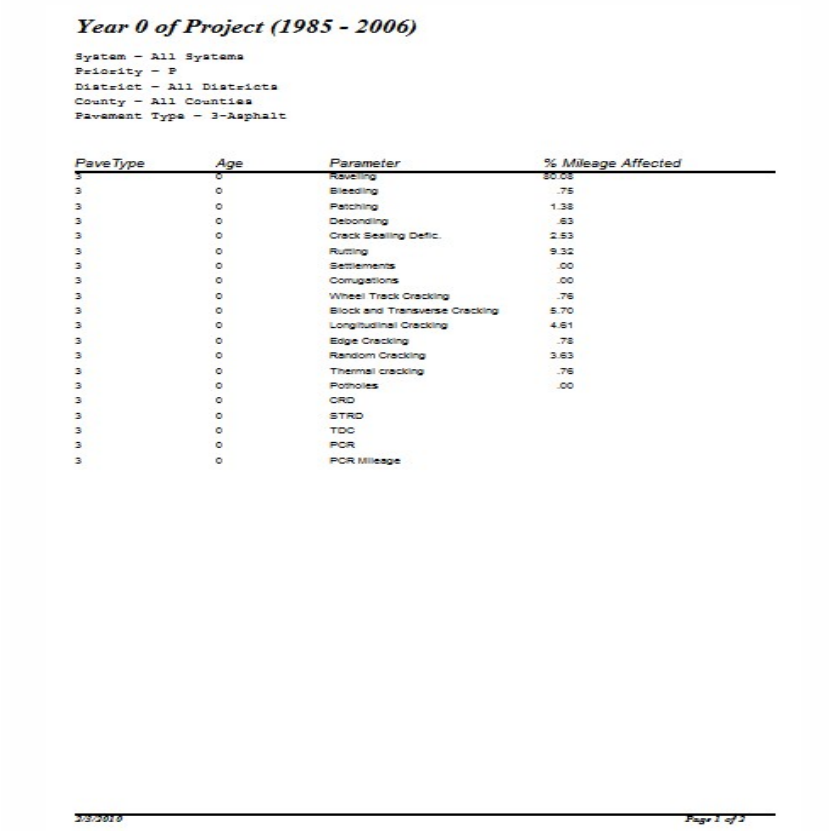


Figure 8.20 Average PCR and Distresses by Project Age

Example:

Figure 8.21 shows "Year 0" or the condition immediately after overlays, on priority system, flexible pavements. This report is generated by selecting "All Systems" under "System," "P" under "Priority," "All" under "District," "All Counties" under "County," "3-Asphalt" under "Pave Type," "1985" under "From Year," "2006" under "To Year," "50 and 60" under "Activity," "0" under "Project Year," "Add All" under "Activity," and "By Mileage" under "Analysis Options."



Year 0 of Project (1985 - 2006)

System – All Systems
Priority – P
District – All Districts
County – All Counties
Pavement Type – 3-Asphalt

PaveType	Age	Parameter	% Mileage Affected
3	0	Raveling	80.08
3	0	Bleeding	.75
3	0	Patching	1.38
3	0	Debonding	.63
3	0	Crack Sealing Defic.	2.53
3	0	Rutting	9.32
3	0	Settlements	.00
3	0	Corrugations	.00
3	0	Wheel Track Cracking	.76
3	0	Block and Transverse Cracking	5.70
3	0	Longitudinal Cracking	4.61
3	0	Edge Cracking	.78
3	0	Random Cracking	3.63
3	0	Thermal cracking	.76
3	0	Potholes	.00
3	0	CRD	
3	0	STRD	
3	0	TDC	
3	0	PCR	
3	0	PCR Mileage	

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Figure 8.21 Average PCR and Distresses by Project Age Output

8.8.2 Average by Calendar Year

This function reports the average distresses, CRD (cracking deduct), PCR and STRD (structural deduct) by pavement type, district, and county for a given calendar year.

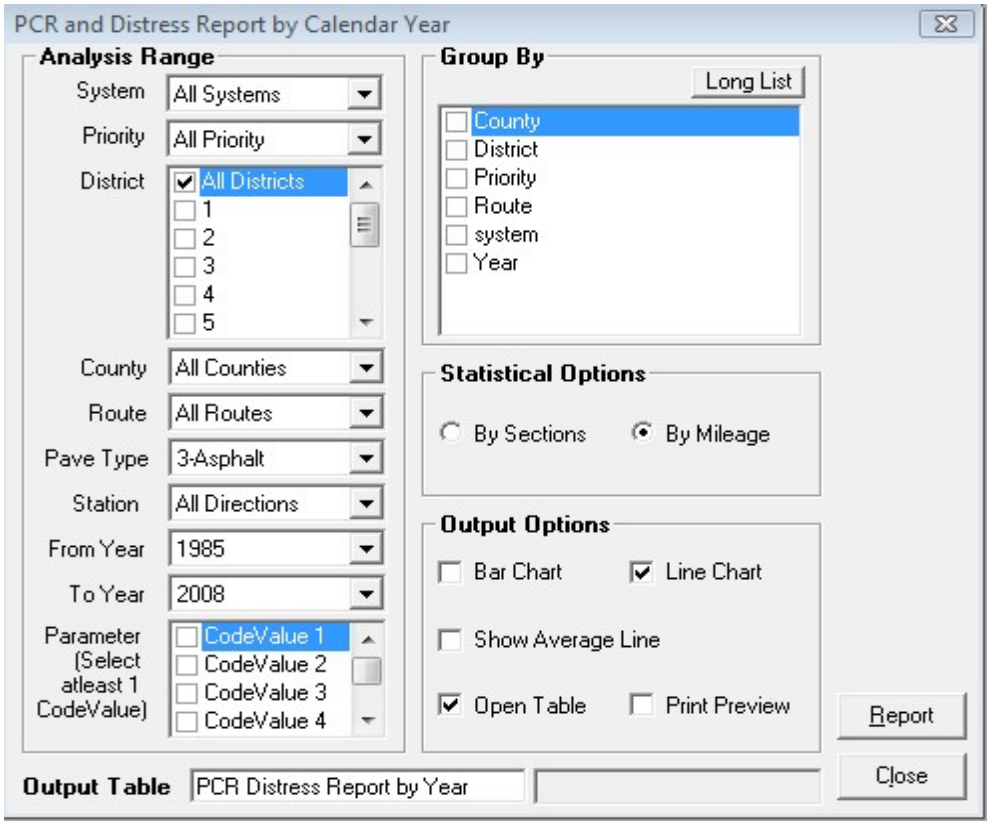
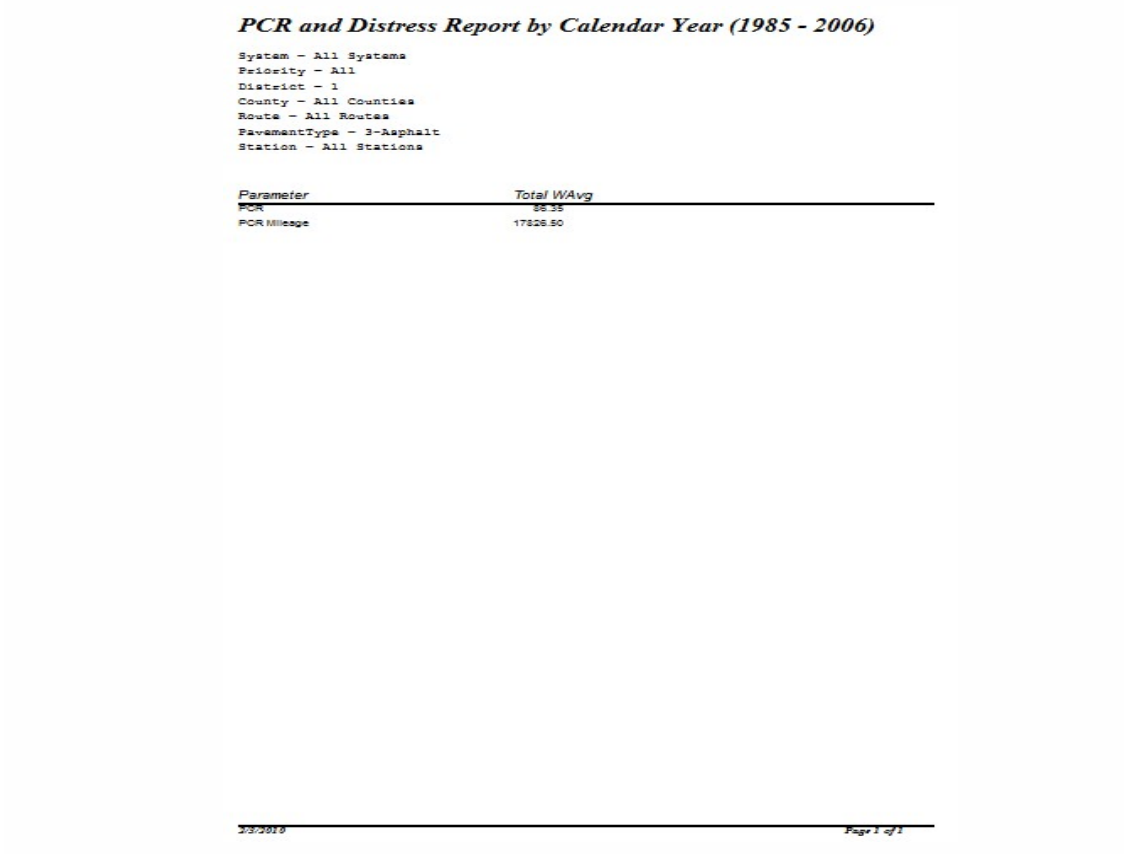


Figure 8.22 Average PCR and Distresses by Calendar Year

Example:

Figure 8.24 shows the PCR and Distress Average by Calendar Year report for all distresses in flexible pavements, for all systems, all priorities, in District 1 from 1985 to 2006.



PCR and Distress Report by Calendar Year (1985 - 2006)

System – All Systems
Priority – All
District – 1
County – All Counties
Route – All Routes
PavementType – 3-Asphalt
Station – All Stations

Parameter	Total WAvg
PCR	86.35
PCR Mileage	17826.50

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Figure 8.23 PCR and Distresses by Calendar Year Output

8.9 RIDE QUALITY

This report gives the ride quality (in terms of LIRI, RIRI and RN) distribution in miles by pavement type, district, year, etc

Source Table: DATA_ODOT, LU_Parameter Range (parameter categories defined by ODOT)
Output Table: The default name for the output table is "LIRI Mileage Report." Users can update this table name by changing the text in the "Output Table name" text box.

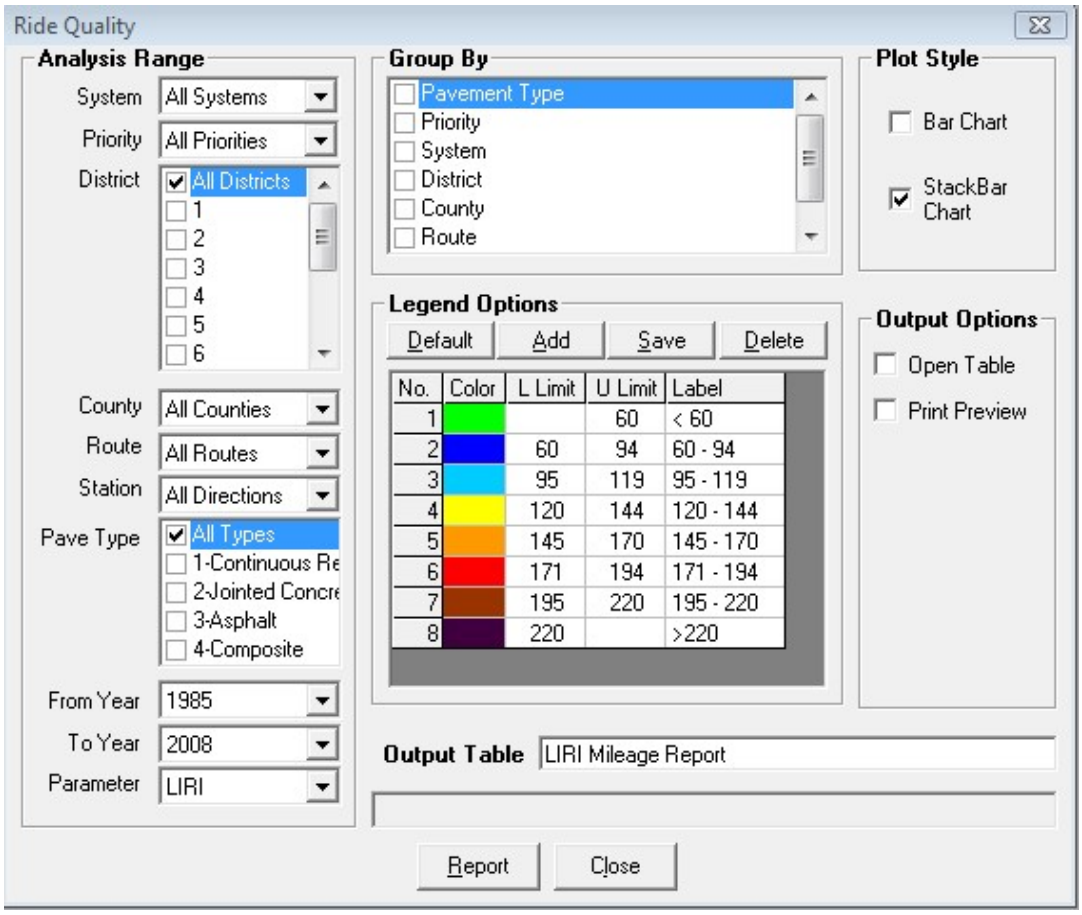


Figure 8.24 Ride Quality Report

Example:

Figure 8.26 shows the Ride Quality Report in miles for LIRI for categories defined by ODOT in District 1 for each year from 1998 to 2006.

This report is generated by selecting "All Systems" under "System," "All" under "Priority," "1" under "District," "All Counties" under "County," "All Types" under "Pave Type," "1985" under "From Year," "2006" under "To Year," "LIRI" under "Parameter," "Year" under "Group By," and "Stackbar Chart" under "Plot Style."

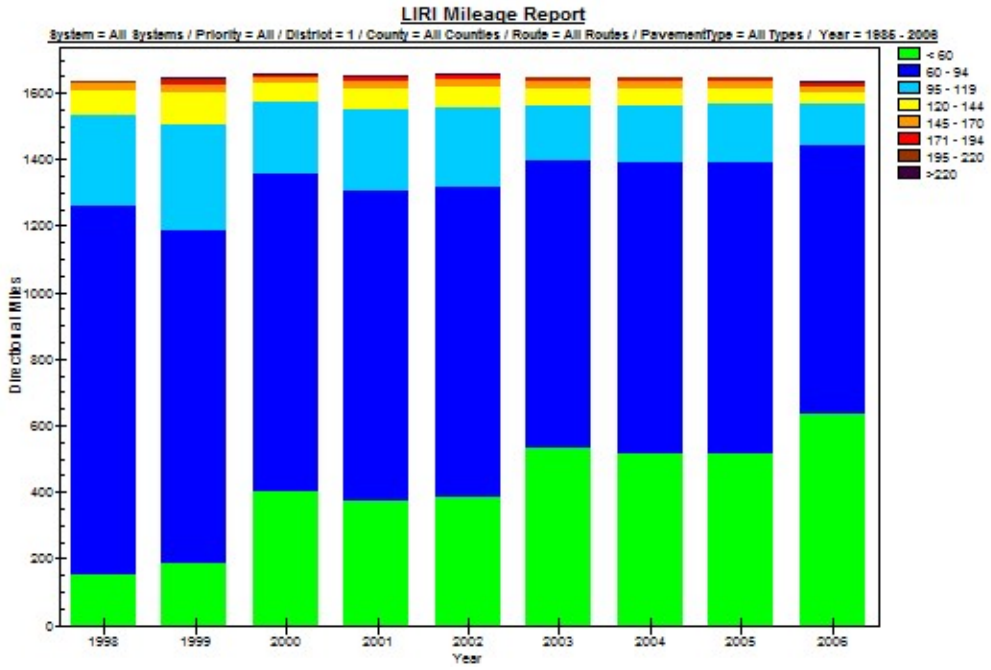


Figure 8.25 Ride Quality Report Output (Left IRI)

8.10 ADDITIONAL REPORTS

The tools under this menu are "Project History Plot," "Statistical Report," "General Mileage Report," and "Map View of a Table."

8.10.1 Project History Plot

This tool, shown in Figure 8.26, is used for viewing the changes in data – PCR, for example – from DATA_ODOT over time for a particular route within a county based on the Original Record (Blog and Elog) from DATA_Project History, or Auto Detection (Blog and Elog) from DATA_Project History_Apparent. The tool also uses colored backgrounds to indicate the repair history of the selected route.

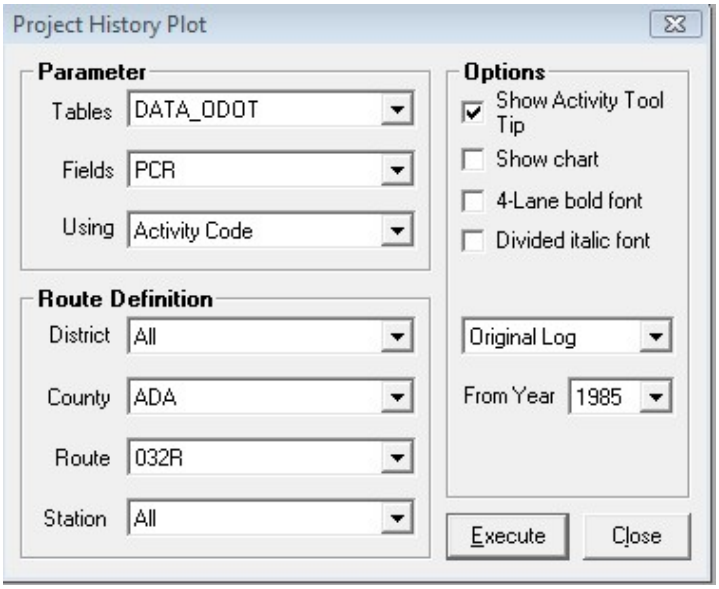
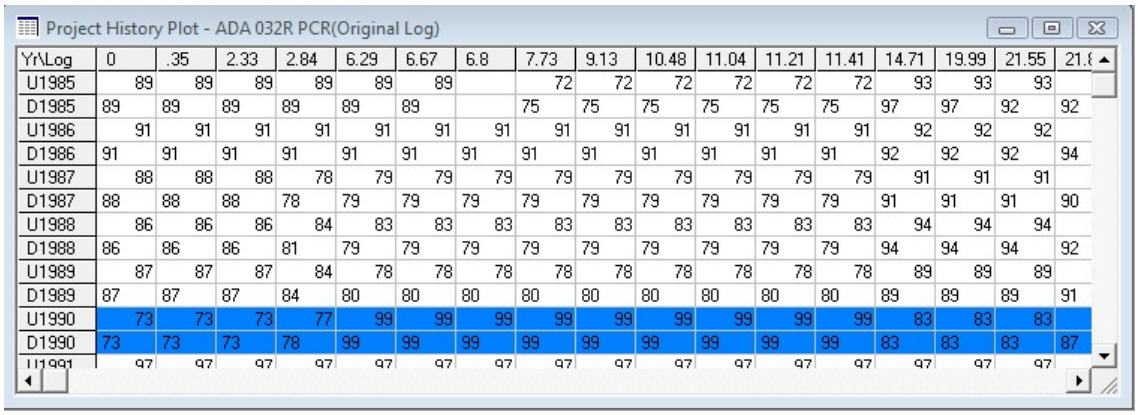


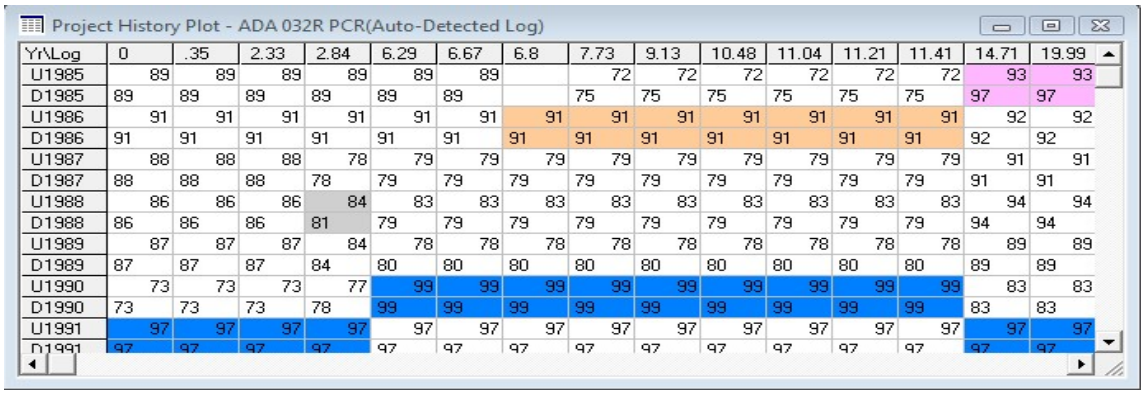
Figure 8.26 Project History Plot

The plot shown in Figure 8.27 was generated by selecting "ADA" under "County," "032R" under "Route," and "Original Log" under "Options." Figure 8.29 was generated with the same settings but using "Auto Detected" under "Options." Figure 8.29 demonstrates that the Activities are adjusted according to PCR jumps.



Yr\Log	0	.35	2.33	2.84	6.29	6.67	6.8	7.73	9.13	10.48	11.04	11.21	11.41	14.71	19.99	21.55	21.8
U1985	89	89	89	89	89	89		72	72	72	72	72	72	93	93	93	
D1985	89	89	89	89	89	89		75	75	75	75	75	75	97	97	92	92
U1986	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92	92	
D1986	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92	92	94
U1987	88	88	88	78	79	79	79	79	79	79	79	79	79	91	91	91	
D1987	88	88	88	78	79	79	79	79	79	79	79	79	79	91	91	91	90
U1988	86	86	86	84	83	83	83	83	83	83	83	83	83	94	94	94	
D1988	86	86	86	81	79	79	79	79	79	79	79	79	79	94	94	94	92
U1989	87	87	87	84	78	78	78	78	78	78	78	78	78	89	89	89	
D1989	87	87	87	84	80	80	80	80	80	80	80	80	80	89	89	89	91
U1990	73	73	73	77	99	99	99	99	99	99	99	99	99	83	83	83	
D1990	73	73	73	78	99	99	99	99	99	99	99	99	99	83	83	83	87
U1991	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97	

Figure 8.27 Project History Plot Based on Original Log



Yr\Log	0	.35	2.33	2.84	6.29	6.67	6.8	7.73	9.13	10.48	11.04	11.21	11.41	14.71	19.99
U1985	89	89	89	89	89	89		72	72	72	72	72	72	93	93
D1985	89	89	89	89	89	89		75	75	75	75	75	75	97	97
U1986	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92
D1986	91	91	91	91	91	91	91	91	91	91	91	91	91	92	92
U1987	88	88	88	78	79	79	79	79	79	79	79	79	79	91	91
D1987	88	88	88	78	79	79	79	79	79	79	79	79	79	91	91
U1988	86	86	86	84	83	83	83	83	83	83	83	83	83	94	94
D1988	86	86	86	81	79	79	79	79	79	79	79	79	79	94	94
U1989	87	87	87	84	78	78	78	78	78	78	78	78	78	89	89
D1989	87	87	87	84	80	80	80	80	80	80	80	80	80	89	89
U1990	73	73	73	77	99	99	99	99	99	99	99	99	99	83	83
D1990	73	73	73	78	99	99	99	99	99	99	99	99	99	83	83
U1991	97	97	97	97	97	97	97	97	97	97	97	97	97	97	97

Figure 8.28 Project History Plot Based on Auto Detected

8.10.2 Statistical Report

This tool is used to calculate average or weighted average values for a user selected parameter. This tool is similar to Traffic Report explained earlier; however in this tool the user can select any parameter from ODOT in addition to traffic and ESAL.

Source Table: DATA_ODOT
Output Table: The default name for the output table is "Statistical Report." Users can update this table name by changing the text in the "Output Table name" text box.

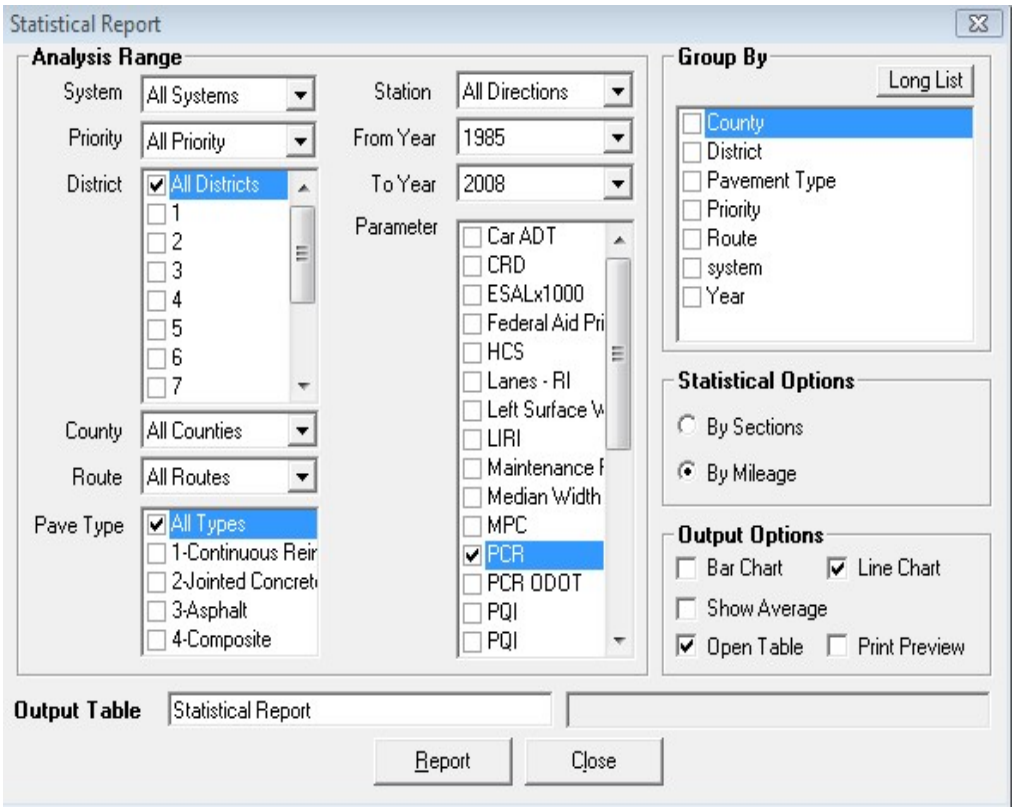


Figure 8.29 Statistical Report User Interface

Output Options

Bar Chart	Output shown in bar chart format
Line Chart	Output shown in line graph format
Show Average	Average of all data shown on graph

Example:

Figure 8.31 shows the Statistical Report for PCR and RN (Ride Number) for all systems, all priorities, all pavement types, in each county and on all routes in District 1, for each year from 1985 to 2006.

This report is generated by selecting "All Systems" under "System," "All" under "Priority," "1" under "District," "All Counties" under "County," "All Types" under "Pave Type," "1985" under "From Year," "2006" under "To Year," "PCR" and "RN" under "Parameter," "Year" under "Group By," "By Mileage" under "Analysis Options," and "Line Chart," Show Average" and "Print Preview" under "Output Options."

Figure 8.31 shows the generated statistical report. ODOT began collecting RN (ride number) data in 1998, and hence RN data slots are empty prior to 1998.

Statistical Report (1985 - 2006)

System = All Systems
Priority = All Priorities
District = 1
County = All Counties
Route = All Routes
Pavement Type = All Types

State Average:
PCR = 79.93
RN = 3.44

Highest:
PCR = 89,Year = 1985
RN = 3.943477,Year = 2003

Lowest:
PCR = 77,Year = 1991
RN = 3.790172,Year = 1999

Year	PCR	PCRMileage	RN	RNMileage
1985	89	255.05		
1986	86	1602.96		
1987	84	276.48		
1988	85	1624.76		
1989	83	278.48		
1990	84	1650.75		
1991	77	281.90		
1992	85	1636.13		
1993	79	280.74		
1994	86	1633.32		
1995	80	380.46		
1996	83	1634.94		

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Figure 8.30 Statistical Report Output

Figure 8.31 shows the PCR chart with an average line.

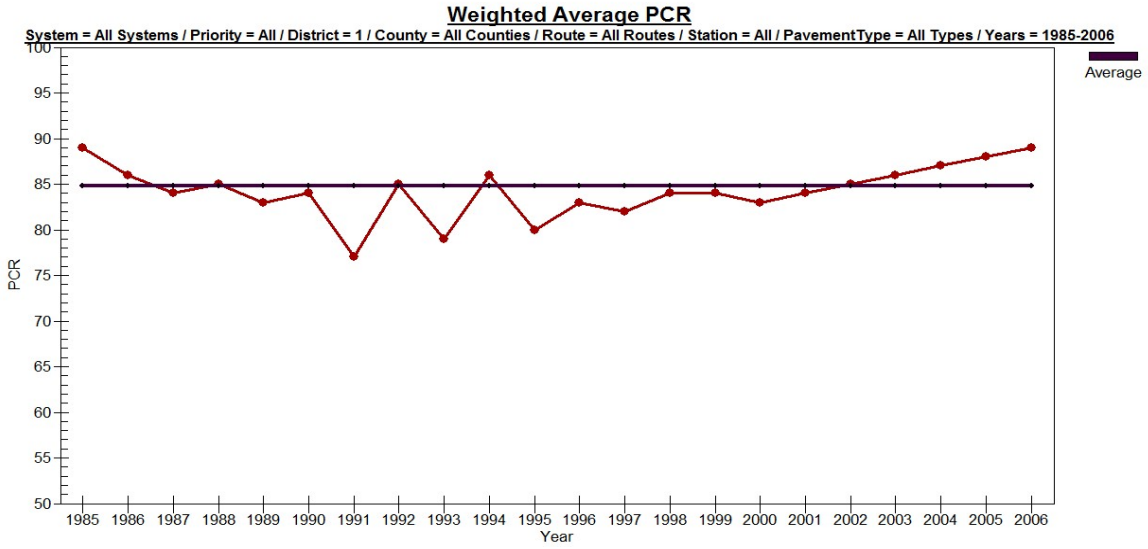

Figure 8.31 PCR Chart

Figure 8.32 shows the RN chart with an average line.

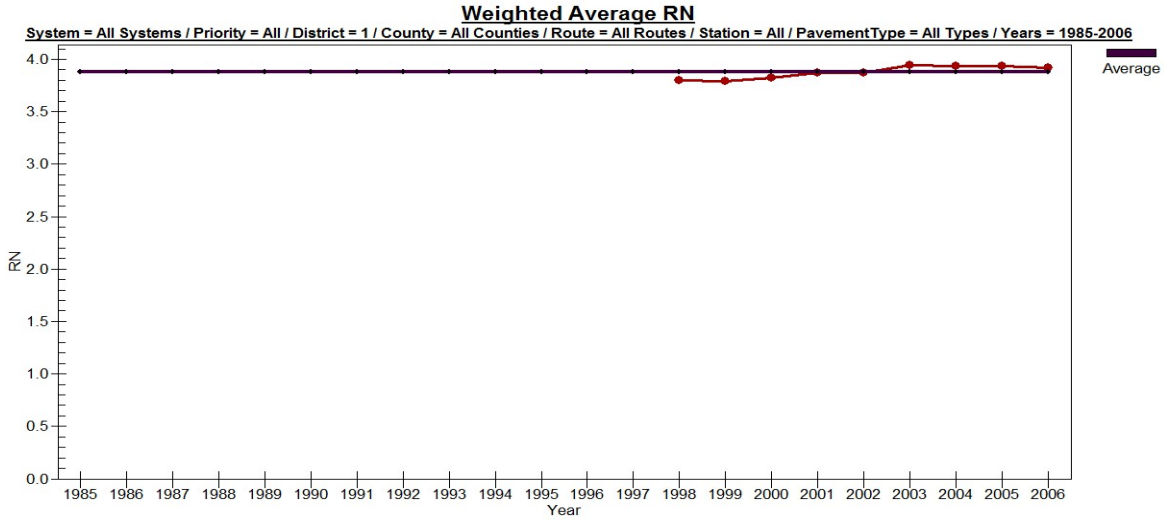

Figure 8.32 RN (Ride Number Chart)

8.10.3 General Mileage Report

This tool calculates the amount of directional mileage covered for a user selected parameter.

Source Table: DATA_ODOT,
Output Table: The default name for the output table is "PCR Mileage Report." Users can update this table name by changing the text in the "Output Table name" text box.

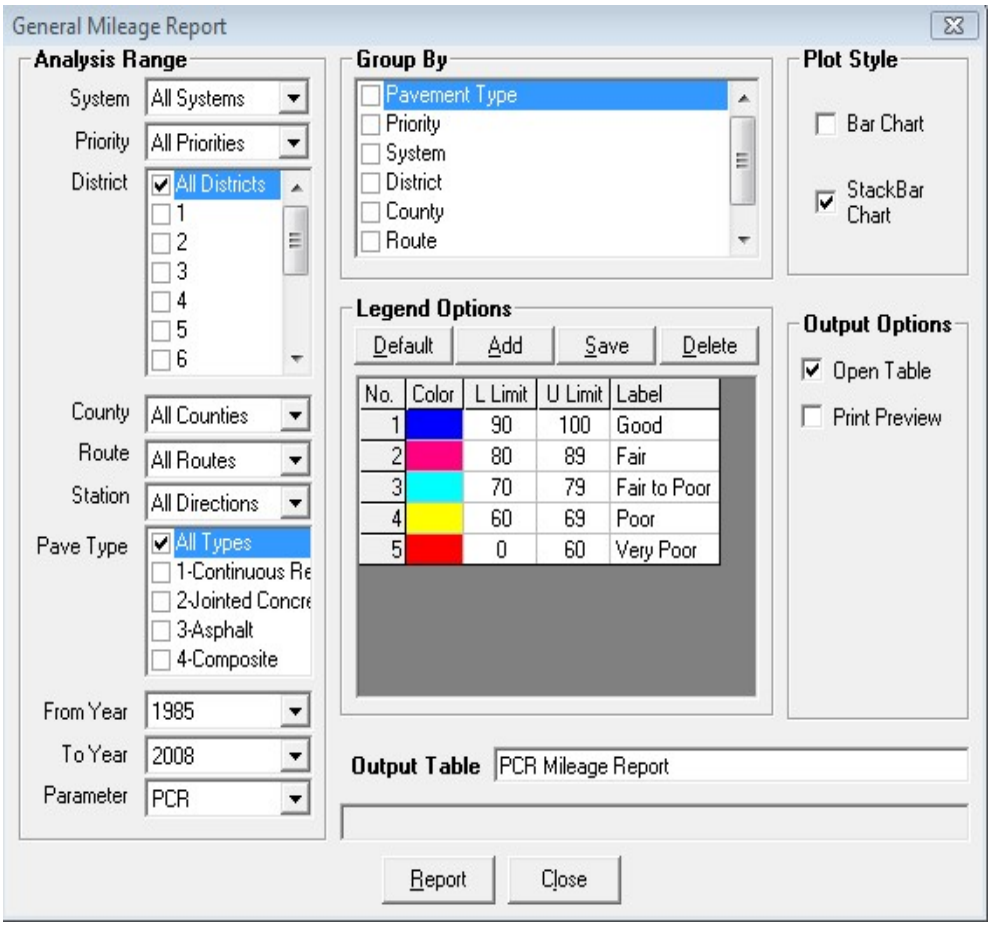

Figure 8.33 General Mileage Report User Interface

Plot Style

Bar Chart Output shown in bar chart format

Stack Bar Chart Output shown in stacked bar chart format

Example:

This report is generated by selecting "All Systems" under "System," "All" under "Priority," "3" under "District," "All Counties" under "County," "All Routes" under "Route," All Directions" under "Station," "All Types" in "Pave Type," "1985" under "From Year," "2006" under "To Year," "PCR" under "Parameter," "Year" under "Group By," and "Stackbar Chart" under "Plot Style."

Figure 8.34 shows the Mileage Report in directional miles for PCR, in categories defined by ODOT in District 3 for each year from 1985 to 2006.

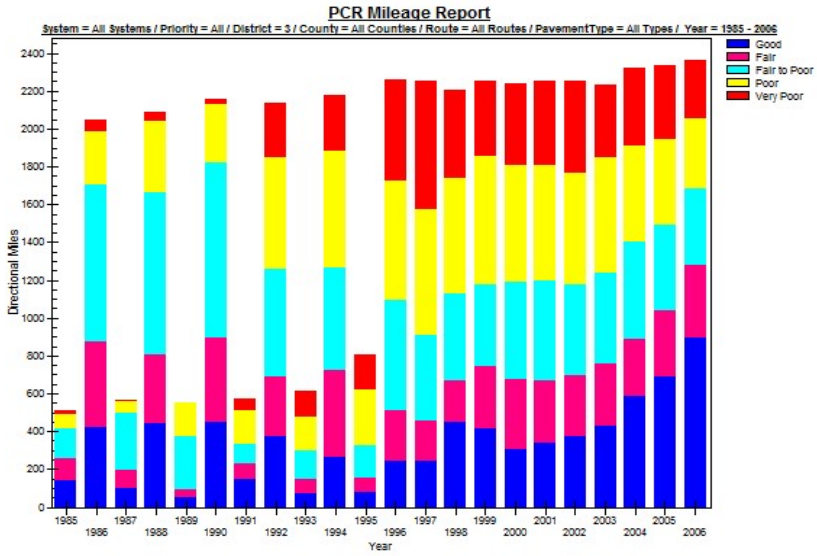

Figure 8.34 PCR Mileage Report Output

8.10.4 Map View of a Table

This tool allows for mapping of attributes if the table includes “County,” “Route,” “Station,” “Blog,” and “Elog” fields.

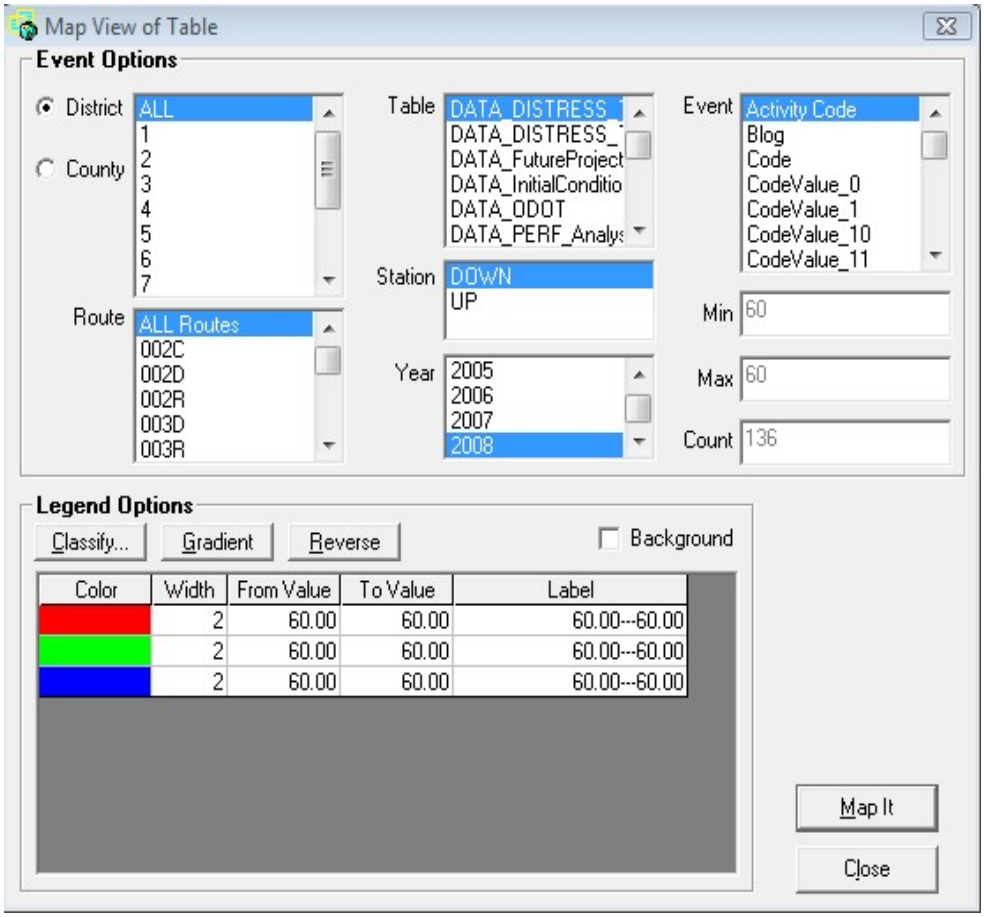

Figure 8.35 Map View of Table User Interface

Legend Options

Classify: Set the number of categories

Gradient: Determine the middle category colors by grading the top and bottom category colors

Reverse: Flip the selected colors

Background: Superimpose map against Ohio geographical outline

SECTION 9 - WINDOW MENU

The "Window" menu includes normal Microsoft functions for controlling the simultaneous display of multiple open windows.

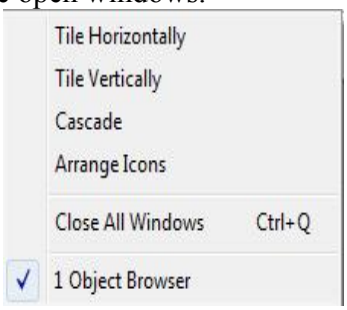

Figure 9.1 ODOTPMIS Window Menu

9.1 TILE HORIZONTALLY

Horizontally tile all non-minimized windows.

9.2 TILE VERTICALLY

Vertically tile all non-minimized windows.

9.3 CASCADE

Cascade all non-minimized windows.

9.4 ARRANGE ICONS

Arrange icons for minimized windows.

9.5 CLOSE ALL WINDOWS (SHORTCUT KEY: CTRL+Q)

Close all opened tables and queries.

SECTION 10 - HELP MENU

Figure 10.1 ODOTPMIS Help Menu

10.1 CONTENTS

Click this option to open the help file. The help file can also be activated by pressing the F1 key. Select the form or tool in question and press F1. Help for that topic will be displayed.

10.2 ABOUT

This option provides downloads of the latest updates for ODOTPMIS and specifies the current version number.

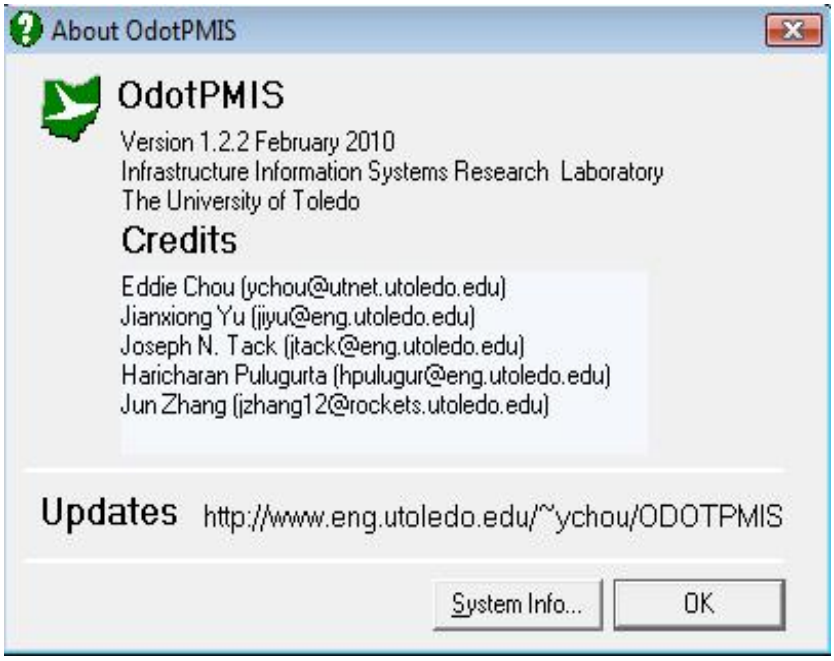

Figure 10.2 ODOTPMIS About Dialog Box